AUGUST 1951 ARCHITECTURAL FORUM

THE MAGAZINE OF BUILDING



ARCHITECT
JOHN C. MANOR
4025 HAWK STREET
SAN DIEGO, CA 92103
293-3110

THE MORTGAGE CRISIS
Round-Table Recommendations (p. 121)

Corning Glass creates a new "human-relations" type (p. 125)

Richmond, Calif., builds the first modern town square complete (p. 135)

"Perfect acoustics" in Britain's Festival Hall but is it art? (p. 178)

Lloyd Wright's sky-chapel (p. 153)

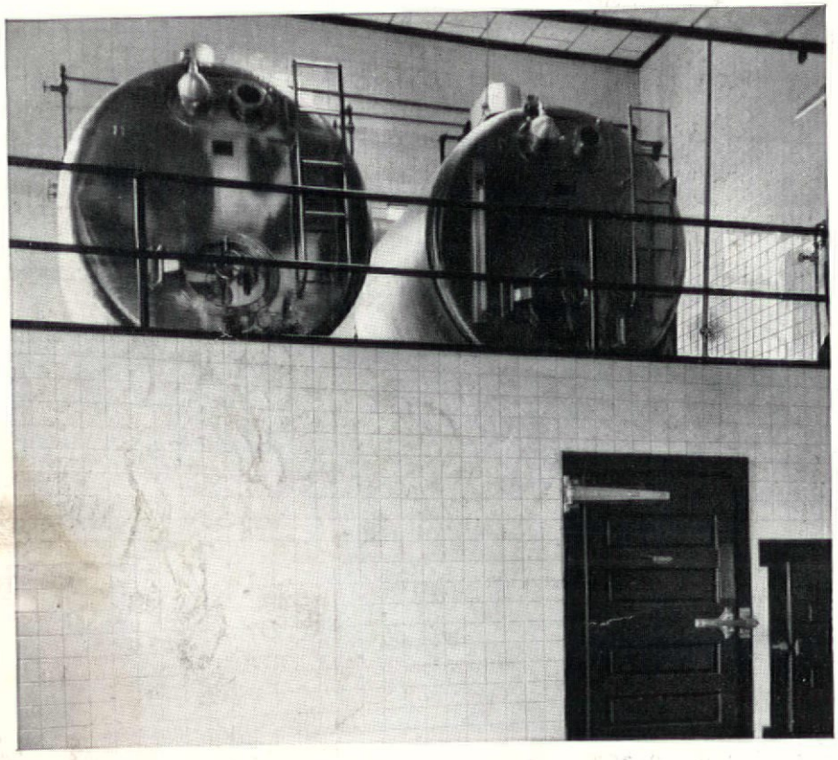
Builder-architect teams: Washington, Austin (p. 162)

Bucky Fuller starts "the one architectural revolution" (p. 144)

New Colors...soft-toned and function fitting

now yours in real clay *Suntile*

WHAT THESE COLORS MEAN TO INDUSTRIAL PRODUCTION



Production has increased both in quantity and in quality!

This is the usual report you'd get if you visited an industrial plant where functionally correct colors have been selected for walls and floors.

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You get more than functionally correct colors with real clay Suntile, however. You also get low maintenance and upkeep, permanence, resistance to fire, economy and ease of cleaning.

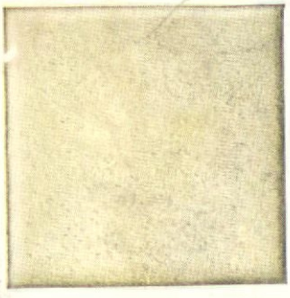
Our new color booklet, "Suntile Functional Color Recommendations," describes the Suntile functional color line, tells you how to use color to greatest advantage. See your local Authorized Suntile Dealer, or write our Dept. MB-8 for a copy. **The Cambridge Tile Mfg. Co., P.O. Box 71, Cincinnati 15, Ohio.**

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Buff Hauteville 724



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ARCHITECTURAL FORUM

THE MAGAZINE OF BUILDING

AUGUST 1951

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MORTGAGE MONEY ROUND TABLE RECOMMENDATIONS — From leaders of the country's lending institutions and builders who met in May to consider the "worst mortgage crisis since 1932" comes a nine point program to restore the flow of credit of the Home-Building Industry.

GLASS CENTER — More than 100,000 visitors to Corning, N. Y., have already seen the glass blowing operation, the museum, library, and community center of Corning Glass Co. and Steuben Glass. For industrialists, a lesson. Archts: Harrison, Abramovitz & Abbe.

MATERIALS-SAVING SCHOOL — To save scarce metals, Architect John Lyon Reid at San Francisco works out classroom wings like rows of little gabled huts, formed by concrete slab frames that branch like trees. A preview of the Sir Francis Drake School.

HOSPITAL STRESSING PUBLIC HEALTH — The Philadelphia backers of the Lankenau Hospital ask Architect Vincent Kling to design a museum, special waiting rooms, educational devices to help the public keep away from hospitals.

CIVIC CENTER — The first modern U. S. town square built in one operation at Richmond, Calif., is both a victory for contemporary design and a discussion piece. Architect: Milton Pflueger.

REAL ESTATE PROFITS OUT OF TAXES — How never to give the tax collector an even break.

BUCKMINSTER FULLER — Like the Indian rope trick, his structural inventions are incredible and done in plain sight. But sober scientists and the Aluminum Co. of Canada recognize his serious purpose and are giving him support in his architectural revolution.

WELDING ECONOMIES — Letters on saving up to 30% on steel through improved technology.

OPEN-SKY CHAPEL — At Palos Verdes, Lloyd Wright nestles a fabric of redwood and glass in an avenue of trees to produce "modern Gothic."

VACATION HOUSES — Architect Henry Hebbeln in Tryon, N. C., designer Henry Hill at Carmel, Calif., and Architect William F. Hempel at Santa Cruz produce retreats that are as open to Nature as the modern bathing suit.

IDEA FACTORY FOR BUILDERS — Young Texas architect Ned Cole has seen his fast-moving design ideas incorporated in 1,500 builder houses during the past year.

BUILDER-ARCHITECT TEAMWORK — Builders suspicious of working with architects can learn from the work of Luria Bros. in Washington, D. C. with members of the firm now known as Keyes, Smith, Satterlee & Lethbridge.

THE ROMANTIC BARN — Author Mary Mix Foley takes a nostalgic farewell look at these beloved structures, explaining why they are obsolete.

MUCH STUDIED CONCERT HALL — Her Royal Festival Hall shows Britain's best ideas on architectural monumentality coupled with fine acoustics. The acoustical solution is discussed by MIT's Richard Bolt.

Cover: Buckminster Fuller's Geodesic Dome supports the people who are putting it up. Photo: copyright Fuller Research Foundation.

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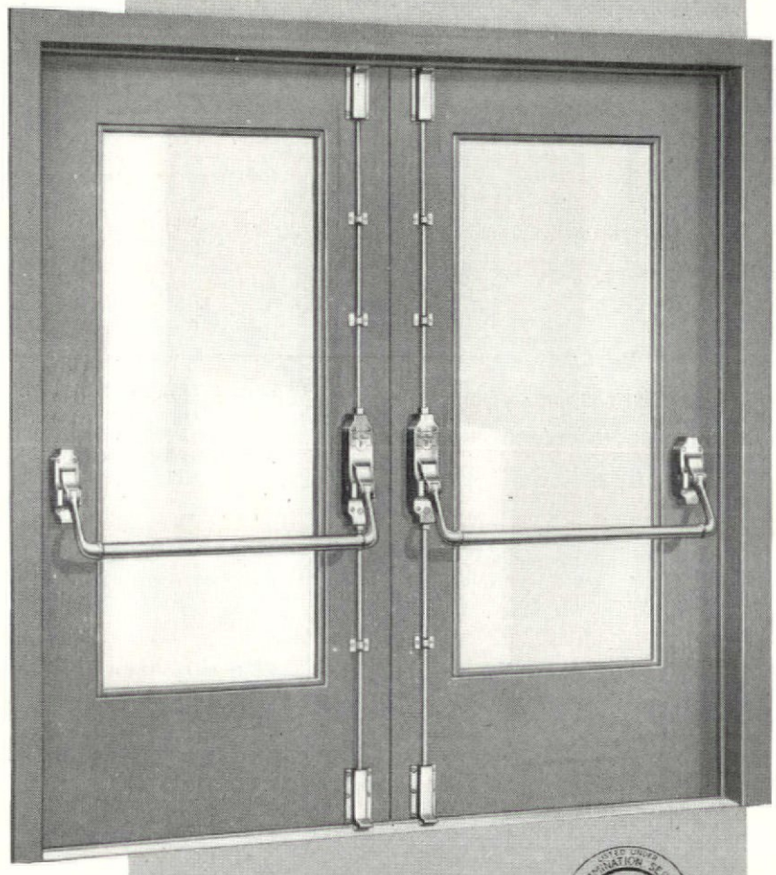
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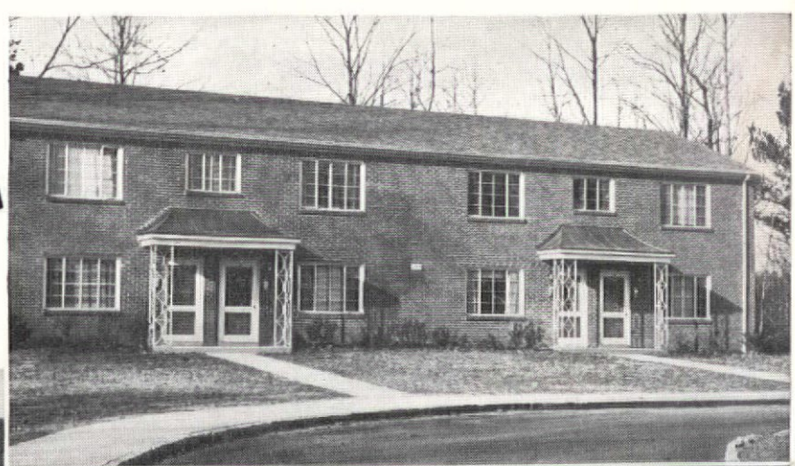
puts 216 Servels in new Atlanta project



Servel's low maintenance cost is like money in your pocket. It's one of the main reasons Servels were chosen exclusively for the brand-new University Heights Apartments in Atlanta, Georgia.

In all parts of the country, builders of large projects have found that Servel refrigerators are packed with the features most likely to please tenants and owners alike. Only Servel, of all refrigerators, operates without a *single moving part* in its freezing system. There is no machinery to wear out or grow noisy . . . a tiny gas flame does all the work. This advanced freezing system means years of trouble-free refrigeration without expensive repairs.

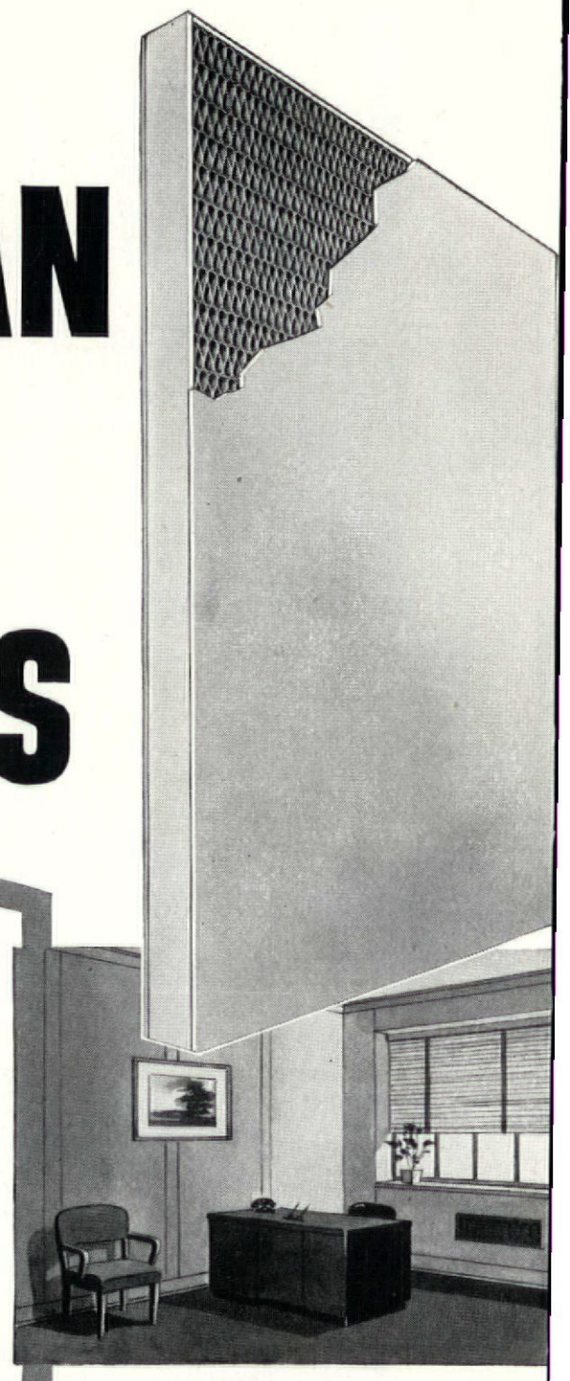
Tenants have come to expect Servel's silent, dependable refrigeration in the most modern developments. For details on the latest models, write Servel, Inc., Dept. C-18, Evansville 20, Indiana.



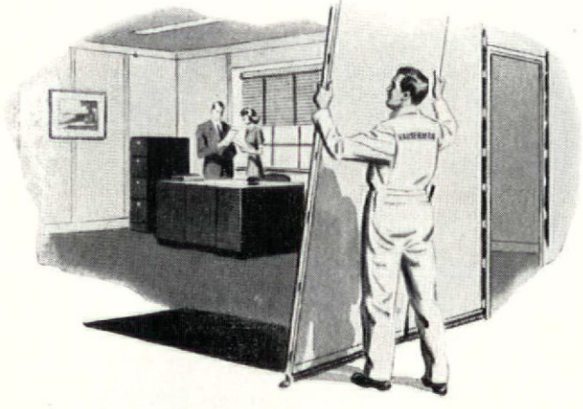


University Heights Apartments, Atlanta, Ga.
Owned by Fred Wilson, built by
Williams Construction Company, Columbus, Ga.

HAUSERMAN MOVABLE PARTITIONS



Same Hauserman Movability



Hauserman *Movable* Partitions with new KORWELD* construction provide all the functional and mechanical advantages that have always been present in Hauserman products. As always, Hauserman Walls will arrive in convenient "packaged" units, factory-finished, *ready to install.* No delays while building crafts are coordinated . . . no waiting for several coats of plaster and paint to dry. Factory-supervised erection crews can erect or disassemble and move an average installation *in just one day—with a minimum of dirt, confusion and noise.*

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now made with

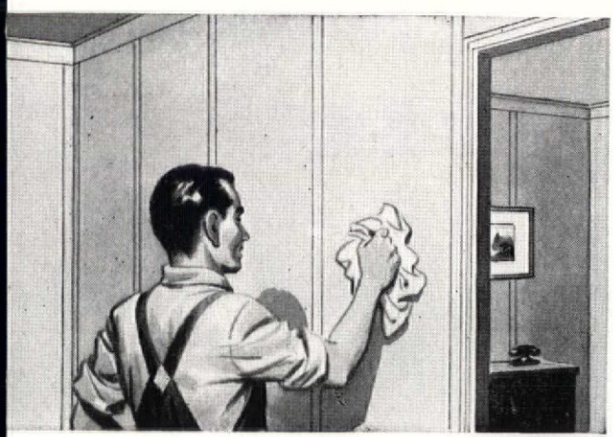
Korweld*

The secret of KORWELD* —a super-strength honeycomb CORE, plastic-WELDed to facing sheets of tough, smooth-surfaced non-metallic composition board.

Revolutionary NEW Panel Construction Developed For Use With Hauserman Movable Partitions

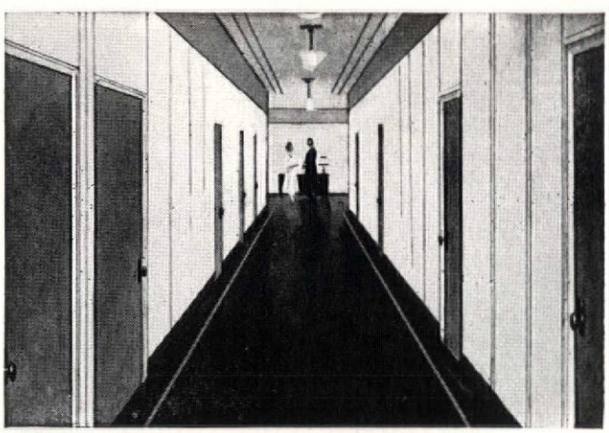
Hauserman—pioneer in the development and application of movable interior partitions—again leads the field with KORWELD*, a new-type construction for partition panel use.

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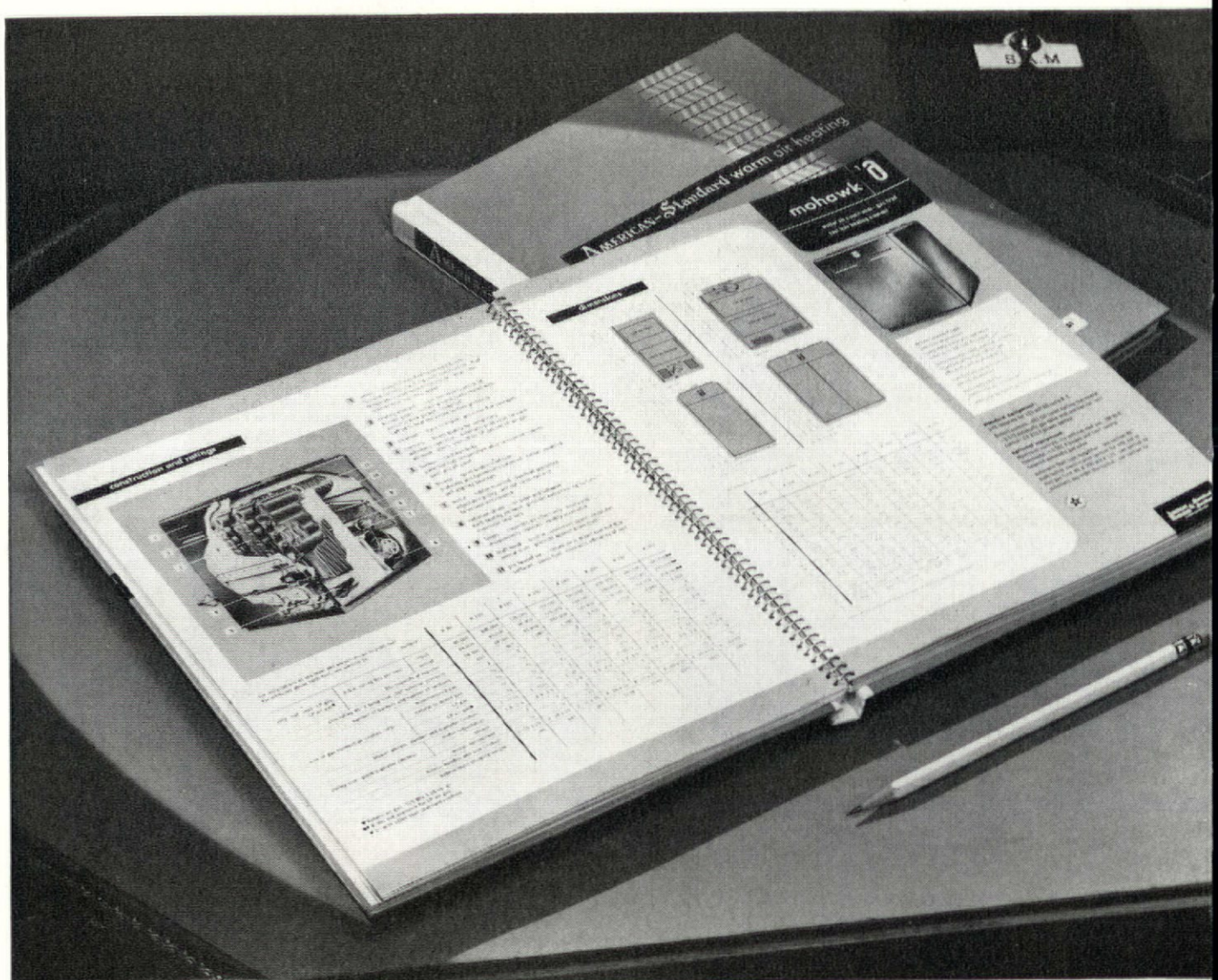
OMPLETE ACCESSORIES

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in the new AMERICAN-Standard



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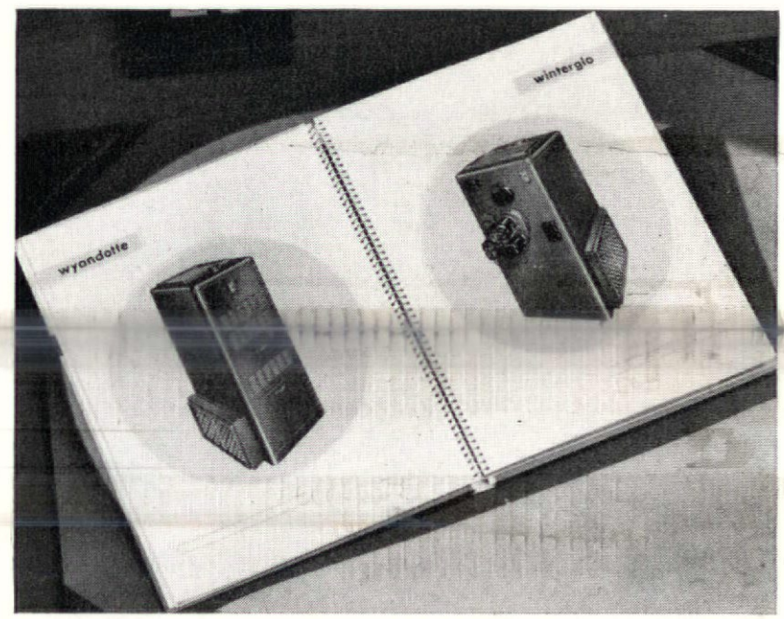
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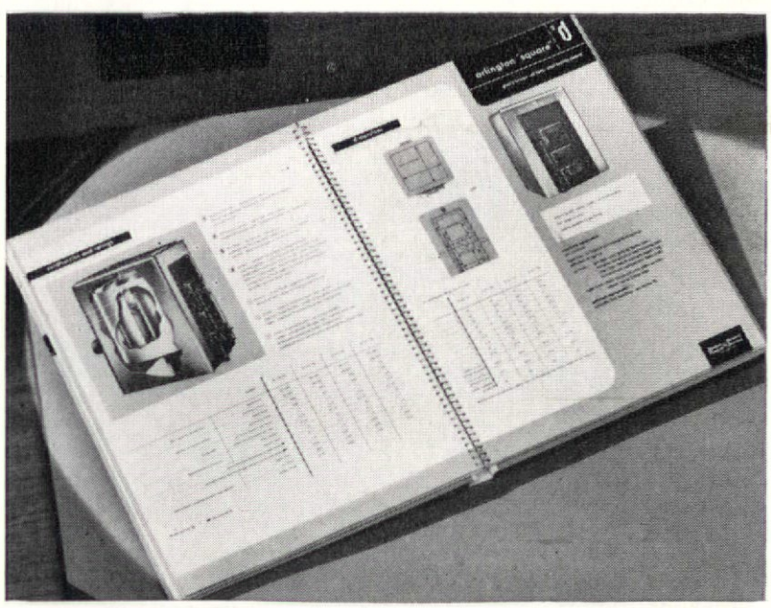
Warm Air Heating Catalogue

● The new American-Standard Warm Air Heating Catalogue is packed with detailed information about a complete line of top-quality heating equipment. Yet it is so compact . . . so simply arranged . . . that you can find full information about any product in six seconds time. (That's how long it takes to turn from *main index* to *selector guide* to *visual unit.)*

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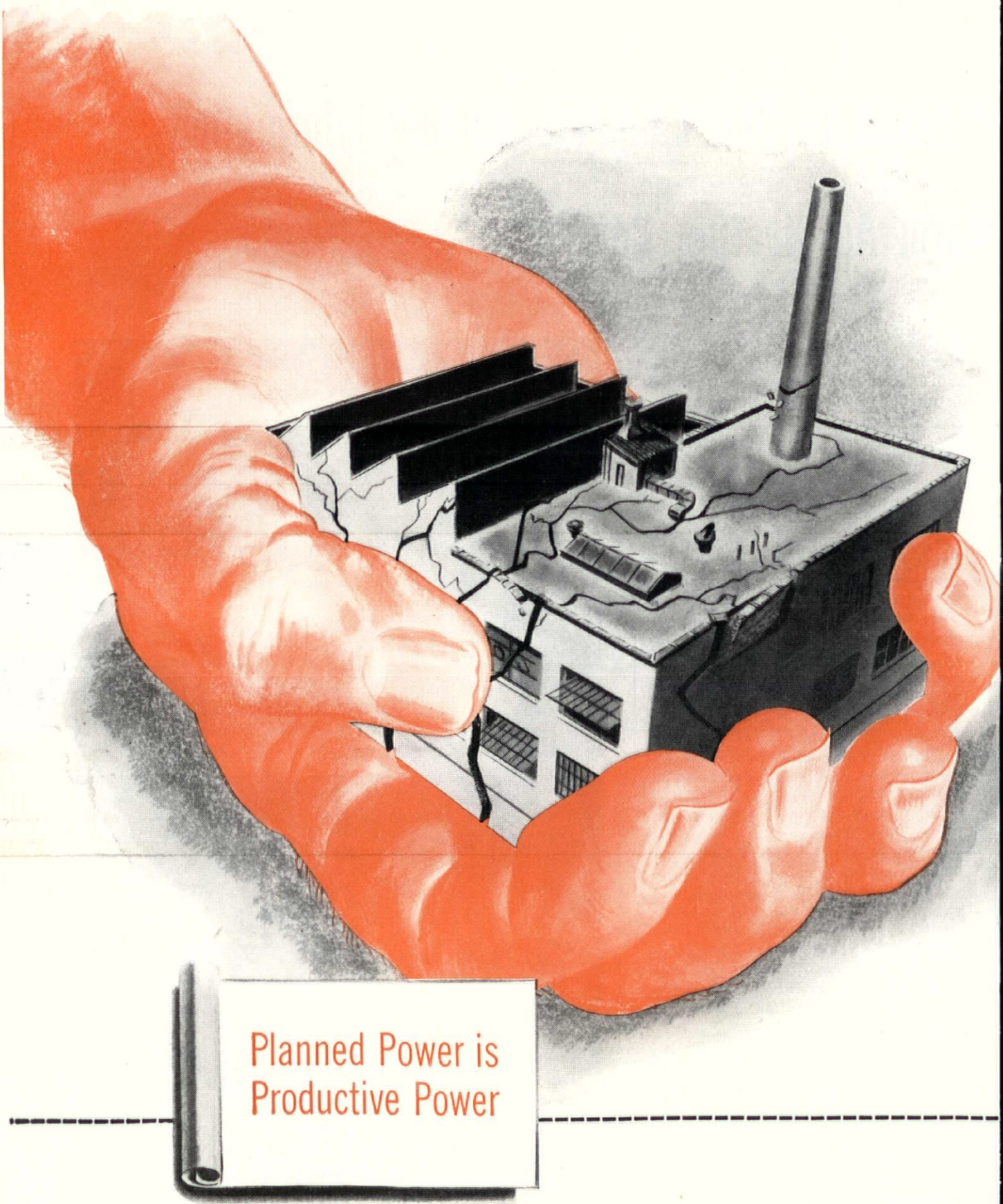
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can throttle production...

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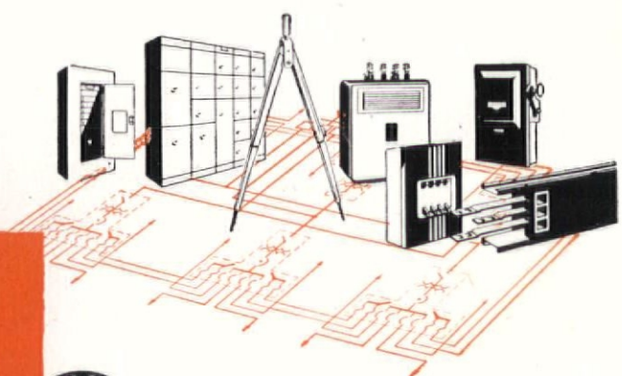
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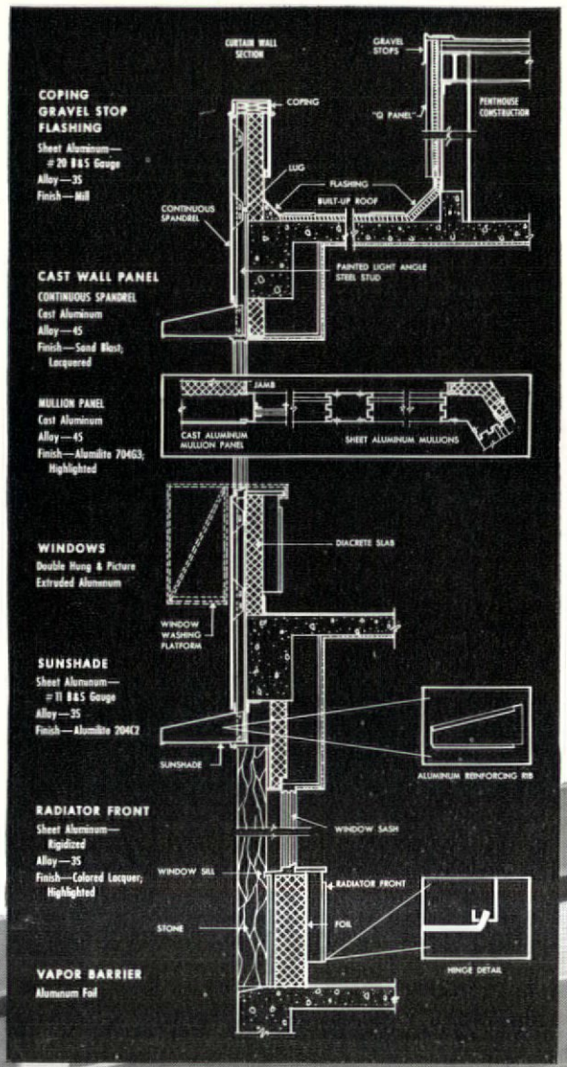
YOU CAN BE SURE.. IF IT'S

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SYSTEM PLANNING

THESE WALLS

Aluminum panels



Bradford Hospital, Bradford, Pa. Thomas K. Hendryx, A. I. A., Architect, Ertel Construction Co., General Contractors. Alcoa Aluminum used for wall panels, windows, sills, sunshade, coping, hardware and trim.

WENT ON FROM THE INSIDE

speed construction . . . . eliminate scaffolds

HERE is a new type of construction that you will see more of in the future. These walls of Alcoa Aluminum panels, extending from one course of windows to the next, were installed from inside the building. Then backed up with insulating slabs of lightweight aggregates. Only platforms required were the building's floors. Materials were moved up on interior elevators.

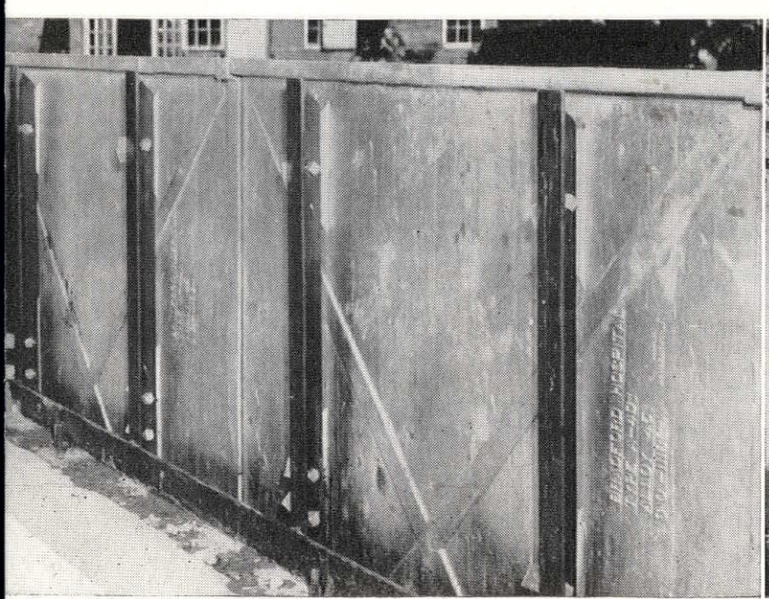
And because the exterior walls, windows, sills, sunshade and copings are long-lasting, weather-resisting Alcoa Aluminum, exterior painting costs were eliminated from the hospital's budget—forever.

Many of the aluminum application methods used here were pioneered by Alcoa. Today, although the supply of aluminum is limited by rearmament needs, Alcoa engineers are continuing to work with forward-looking architects on more efficient, more economical building for tomorrow. For information on any application of aluminum, call your nearby Alcoa sales office or write, ALUMINUM COMPANY OF AMERICA, 1887H Gulf Bldg., Pittsburgh 19, Pa.

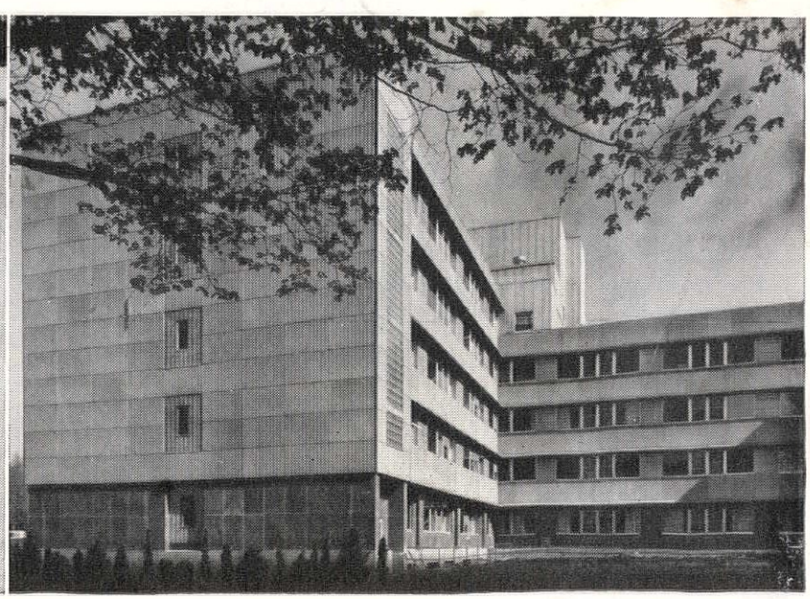
ALCOA

FIRST IN ALUMINUM

Large, light (4 lbs. per sq. ft.) aluminum panels are installed easily by two men. Anchor lugs inside the panels are bolted to light, angle steel studs and wall is ready for backup.



The variety of finishes available with aluminum, permitted the designer to achieve variety and harmony by blending aluminum sheet, extrusions, and sandblasted and polished castings.



NOTES FROM AN ARCHITECT'S SKETCH PAD

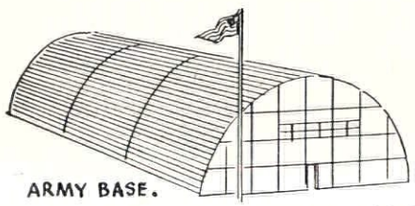
LOOKS LIKE THAT VERSATILE DRAVO "COUNTERFLO" HEATER CAN BE USED ON PRACTICALLY ALL OUR JOBS.



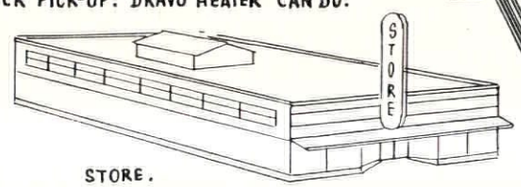
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CHURCH. INTERMITTENT HEATING. NEEDS QUICK PICK-UP. DRAVO HEATER CAN DO.



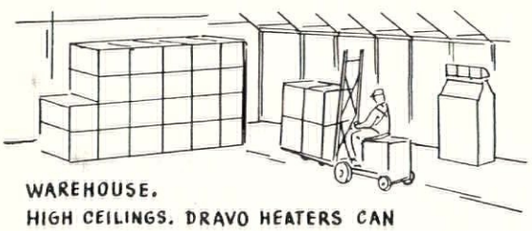
ARMY BASE.
WINTER CONSTRUCTION ON THESE BARRACKS. CAN INSTALL DRAVO HEATERS EARLY FOR HEAT DURING CONSTRUCTION AND AFTER COMPLETION.



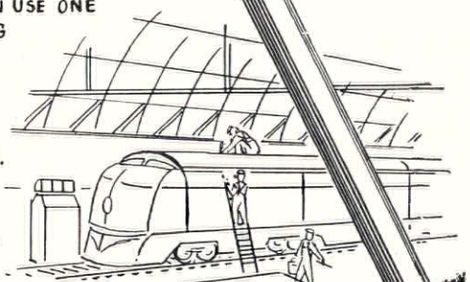
STORE.
WITH DRAVO HEATERS, CAN USE ONE SET OF DUCTS FOR HEATING AND AIR-CONDITIONING.



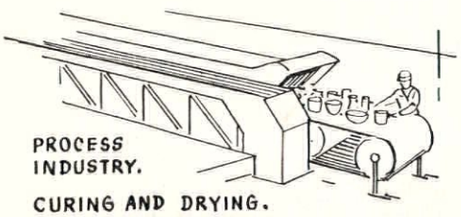
INDUSTRIAL PLANT.
DRAVO HEATERS HAVE 150' AIR THROW. NO DUCTS NEEDED.



WAREHOUSE.
HIGH CEILINGS. DRAVO HEATERS CAN REDUCE ROOF HEAT LOSS, KEEP HEAT WHERE IT'S NEEDED.



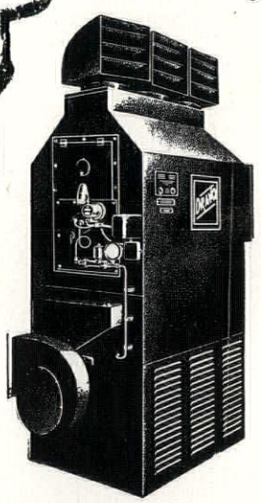
DIESEL RAILROAD SHOP.
NEEDS HEAT AT WORKING LEVEL. DRAVO HEATERS IDEAL.



PROCESS INDUSTRY.
CURING AND DRYING. SPECIFY DRAVO HERE.



FOUNDRY.
EXHAUST EQUIPMENT CREATES HEATING AND VENTILATING PROBLEM. USE DRAVO HEATERS FOR TEMPERED "MAKE-UP" AIR.



DRAVO
CORPORATION

A case study on any [illegible] installations is yours for the asking. For complete information on how Dravo "Counterflo" Heaters can help solve your heating problems, write for Bulletin LM- 26-3

HEATING DEPARTMENT, DRAVO BUILDING, PITTSBURGH 22, PA.

PITTSBURGH • CLEVELAND • PHILADELPHIA • DETROIT • NEW YORK • CHICAGO • ATLANTA • BOSTON

Sales Representatives in Principal Cities. Mfd. and Sold in Canada by Marine Industries, Ltd., Sorel, Quebec
Export Associates: Lynch, Wilde & Co., Washington 9, D. C.

Using **Copper** wisely in **Building Design** and **Construction**

WRITE FOR DETAIL DRAWINGS SERIES 12A

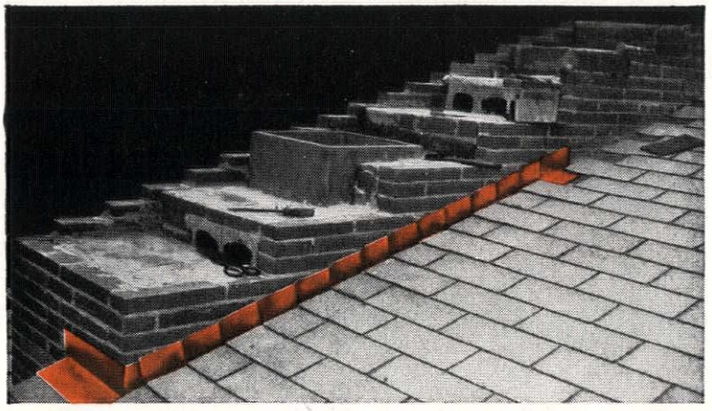
Construction details of copper flashings for this and many other types of chimney and roof designs are available on 8½" x 11" sheets convenient for filing. This is one of a series of advertisements presenting designs to illustrate how a little copper can go a long way in achieving good building construction.

Through-to-flue chimney flashing

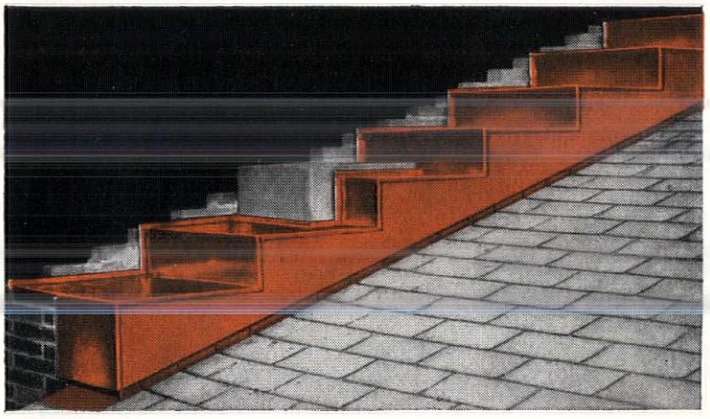
RIGHT FROM THE START this flashing design provides a permanent barrier to water which seeps or is wind-driven through the porous brick and mortar. Water reaching the through-to-flue flashing can drain in only one direction—to the roof where it belongs.

And it isn't only a big architectural chimney, as pictured, that may cause trouble and expense unless properly flashed. The small ones are just as vulnerable and leaks are just as hard to locate and repair. Guard against this on your work . . . standardize on through-to-flue design.

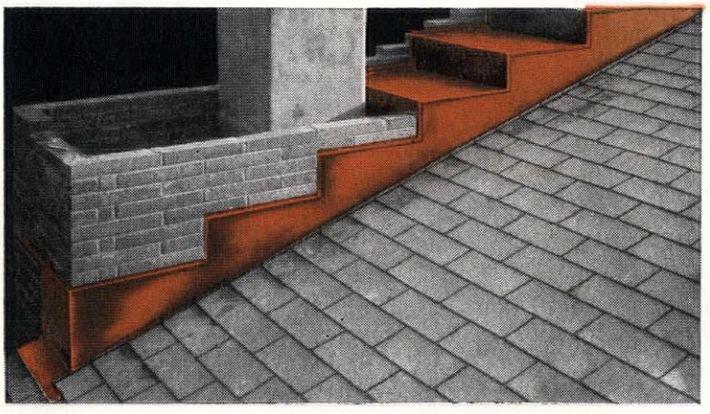
For suggestions or counsel on any problem involving sheet copper and for detail drawings of this and other uses of sheet copper in building construction, write to The American Brass Company, Waterbury 20, Connecticut. In Canada: Anaconda American Brass Ltd., New Toronto, Ontario. 5101



1 Copper base flashing being installed. Note how flashing is interlaced with shingle courses.



2 Shop prefabricated cap flashing in position, through-to-flue.



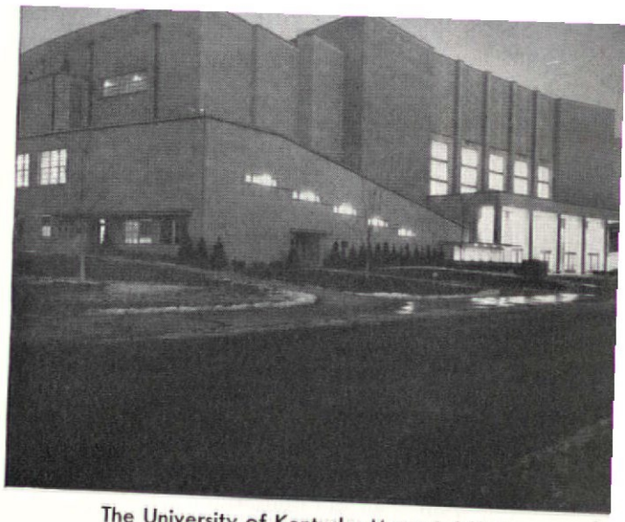
3 Brickwork resumed. Space within will be filled with masonry rubble.

nothing serves like **ANACONDA®** **COPPER**

Imagination and practical planning



...in a striking coliseum



The University of Kentucky Memorial Coliseum,
Lexington, Kentucky.
Proctor-Ingels, electrical engineers.



John T. Gillig



Hugh Meriwether



Ernst V. Johnson

Only architects with imagination could have conceived the bold, simple design of the University of Kentucky's Memorial Coliseum at Lexington. Only architects with foresight could have transformed this design into such a strikingly modern, completely functional field house and auditorium seating 13,000 people. Working together, three men from Lexington did the job—and left an architectural milestone.

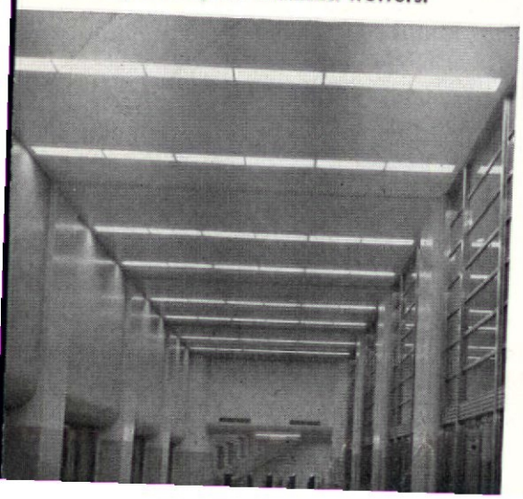
But Mr. John Gillig, the senior architect, who supervised the entire project, Mr. Ernst Johnson, who did the architectural design work and Mr. Hugh Meriwether, who assisted the planning and wrote the specifications, know that the practical architect is also a practical businessman—whose job is to get full value from every dollar that goes into a building. And, being practical, they are great believers in quality . . . wherever quality means better performance and longer service life.

That's why it is interesting to note that these architects selected Day-Brite fixtures to light the main foyer and concourse, the ramps, offices, lounges and corridors of this well-lighted Coliseum. These architects realized that Day-Brite's initial cost would quickly be offset by lower installation, maintenance and operating costs. But, regardless of cost, they were determined to have this building illuminated properly—with the best lighting fixtures on the market.

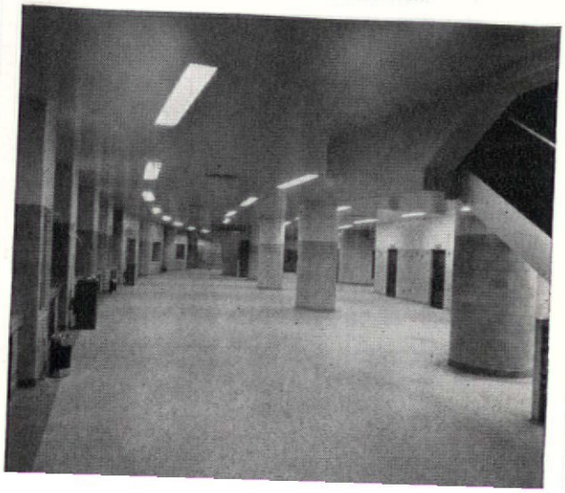
The wide Day-Brite line contains fixtures that are designed for all kinds of building projects . . . and *every* Day-Brite fixture sold is guaranteed to offer top-quality performance at reasonable cost. Are *you* familiar with Day-Brite?

Day-Brite Lighting, Inc., 5471 Bulwer Ave., St. Louis 7, Missouri. In Canada: Amalgamated Electric Corp., Ltd., Toronto 6, Ontario. Distributed nationally by leading electrical wholesalers.

The towering expanse of the foyer is lighted by Day-Brite glass-enclosed troffers.



Day-Brite Boxco Troffers flood the main concourse with glareless illumination.



"DECIDEDLY BETTER"
DAY-BRITE
Lighting Fixtures

KEEP YOUR HOME BUILDING PROFITS UP

. . . WHEN THE SALES CURVE IS DOWN

SWITCH TO PREFABRICATION NOW . . . BUILD THE BETTER P&H WAY

YOU can enjoy smooth selling ahead—even in today's declining home market—if you *switch to prefabrication* now, and build the *better* P & H way.

End your worries over government loan curbs, high costs, material shortages. You can fill housing needs *immediately, profitably,* by building the new 1951 P & H factory-engineered homes.

Build profitably—Whether you now build 5 homes or 500, you can enjoy *volume sales, project savings, minimum risk, prompt delivery, financing,* by following the P & H Builder Profit Plan.

You can sell quality homes priced for every volume market—selected from the *complete* P & H line—floor areas from 672 to 960 square feet . . . two bedrooms or three, full basement or utility, left hand plans or right, end placement plans for narrow lots.

Design variety—Home buyers are tired of *row house monotony.* They want the infinite individuality your projects gain with such P & H special features as gable and hip roofs, gable and hip porches, yard-wide eaves, trellises, jib supports, window boxes, classic panels, shutters and door designs. This page shows only 12 of the 60 elevations, *all reversible,* in the complete P & H line. *And* the bricks are no advertising "gag." The wide P & H gable ends and eaves are adaptable to your own brick and stone veneer designs.

Easy approval—Government and financial agencies, local building authorities and city councils *all* recognize the enduring quality and lasting value of P & H construction, *engineered* by Harnischfeger Corporation.

Financing available—When local financial resources are limited, you can get construction loans or term mortgages through Harnischfeger Corporation's service subsidiary, Builders Acceptance Company. *Write today* for free booklet on the P & H *Builder Profit Plan.*

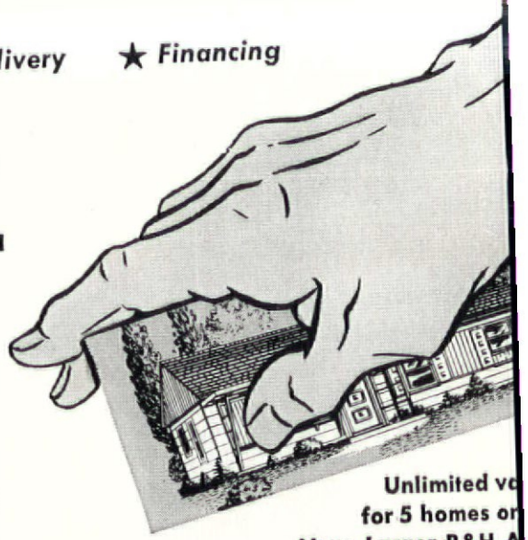
★ *Volume Sales* ★ *Project Savings* ★ *Minimum Risk* ★ *Prompt Delivery* ★ *Financing*

P&H

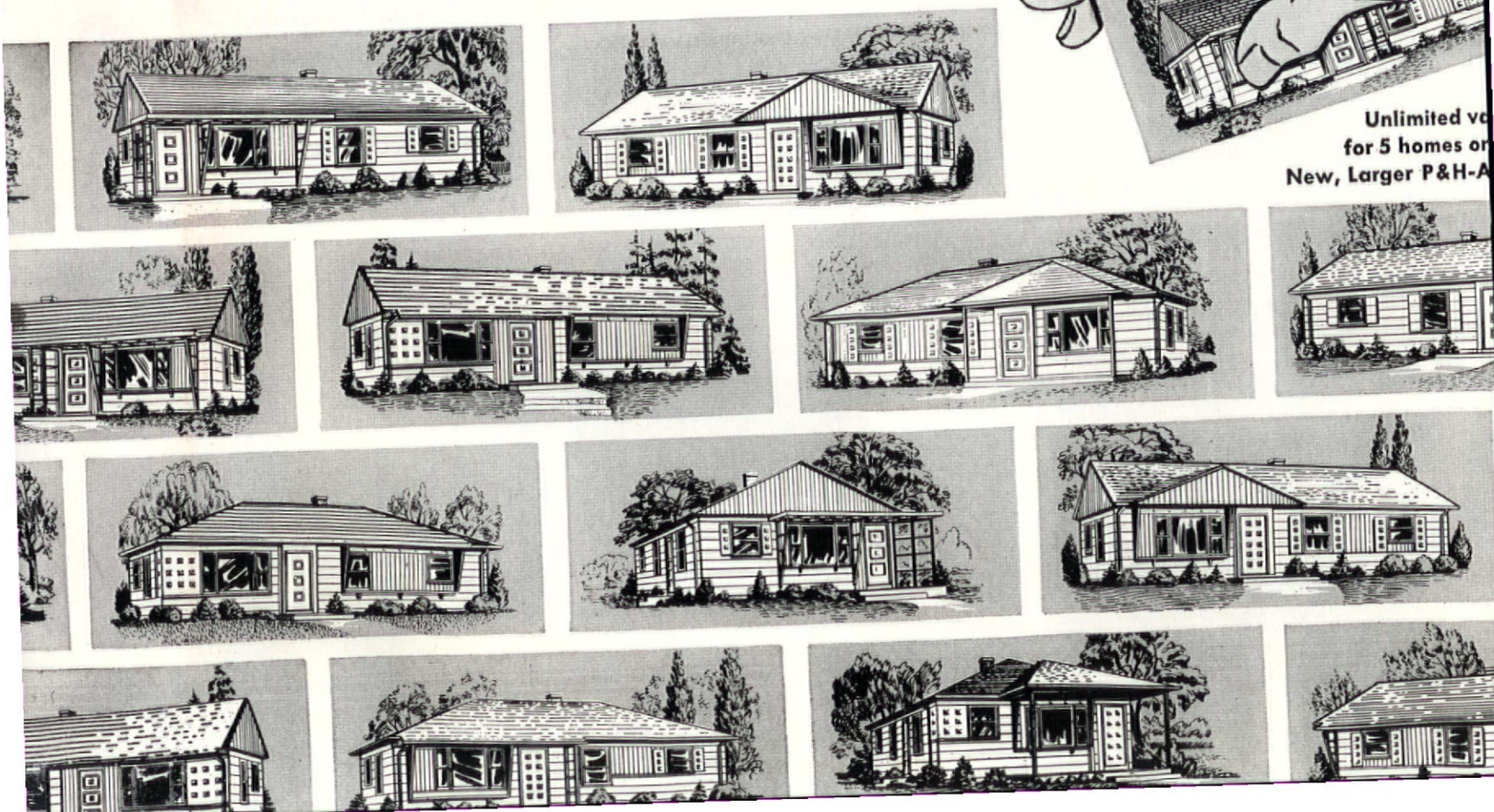
Harnischfeger Corporation

HOUSES DIVISION

18 Spring St., Port Washington, Wisconsin



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for 5 homes or
New, Larger P&H-A





✓EXTRA KITCHEN SPACE
✓COUNTER-LEVEL COOKING
✓VERSATILITY IN PLANNING

Chambers®

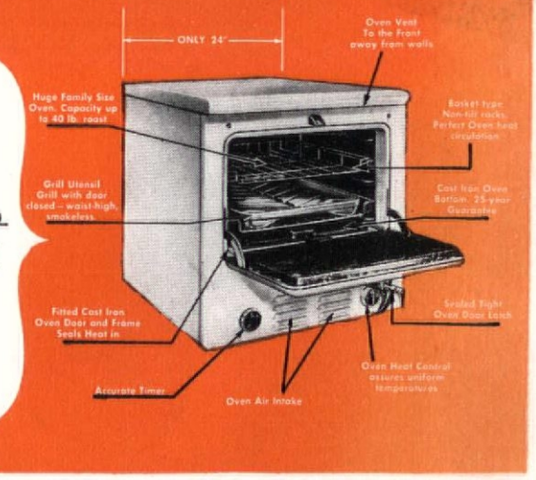
Built-In *GAS* Cooking Units

SPECIFY BUILT-IN GAS COOKING UNITS to utilize every inch of space. Stainless steel exteriors, and oven doors in a choice of seven decorator colors add a final touch to modern, efficient kitchen design. This innovation by Chambers, originator and master-builder of insulated ranges since 1910, is designed to transfer blueprint planning into every-day happy-ness for the homemaker.

FIT THESE GAS "BUILT-INS" INTO YOUR PLANS. They fit where YOU want them to do the most good. The Chambers IN-A-WALL Oven requires only 24 inches of wall space for installation. It meets all the exacting safety requirements of the AMERICAN GAS ASSOCIATION, and may be installed flush on five sides even with combustible cabinet materials. Cooking top units are available too, either to drop into kitchen counters or to mount on a 27" wide base cabinet.

SELL THIS COOKING CONVENIENCE. New home buyers will welcome the advantages of sectionalized cooking equipment. They'll be specially attracted by the Chambers concept of counter-level cooking—of roasting, baking and grilling without crouching or stooping—of enjoying the speed, economy and flexibility of gas cooking with this new Chambers-created equipment.

IN-A-WALL OVEN BY Chambers COOKS WITH THE GAS TURNED *off*®





Send for A. I. A. Specification Sheet NOW!

Chambers Corp., Dept. AFT 81, Shelbyville, Ind.

Gentlemen:

Please send me at once A. I. A. Specification Sheet and other material describing the new Chambers Built-In GAS Cooking Units.

I am an ( ) Architect ( ) Builder-Contractor ( ) Dealer

NAME .....

FIRM NAME .....

ADDRESS .....

CITY ..... ZONE ..... STATE .....

NATURE MADE
... and light that's



Laboratory of the Harrison Hightower Textile Building, Georgia Institute of Technology, Atlanta
Architect : Bush-Brown, Gailey & Hefferman, Atlanta

The ideally lighted space, as designed by Nature, is under a broad tree on a sunny day. Here you have about 1000 footcandles —abundant light—and uniform illumination from all sides—eye-comfort quality.

The purpose of a Daylight Wall is to come as close as possible to this nature-quality illumination. At the regional conference of the Illuminating Engineering Society last May in Cincinnati, Ohio, the idea was emphasized that illumination is a lot more than light meter readings. The human side of illumination should not be forgotten. Seeing involves the whole nervous system. It includes emotions with a sense of strain or a sense of comfort, a sense of spaciousness or of confinement, of union with or separation from the outdoors.

The use of Daylight Walls recognizes seeing as a sensory experience. Such walls provide a sense of spaciousness, the wholesome merging of the outdoors with indoors, and distant vision which is spiritually and optically restful.

In a Daylight Wall the use of *clear flat*



General Office of the E. H. Sargent Co., Chicago
Architects: Olsen & Urbain, Chicago

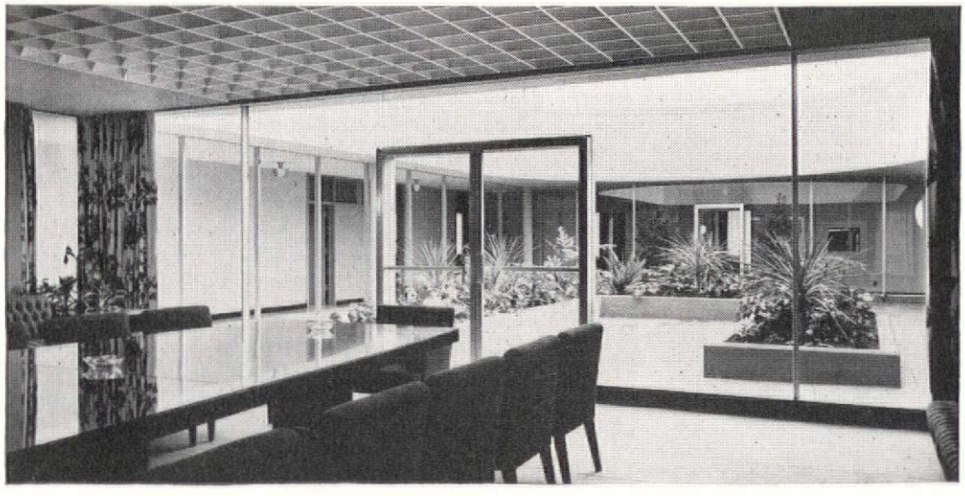
EYES
right for seeing

glass from the floor or sill, *all the way to the ceiling*, is of great advantage to occupants of the room.

Clear glass—because it transmits more light than glass in any other form.

All the way to the ceiling—because any nontransparent material above the window presents a barrier to the eye. This barrier sets a limit to the feeling of spaciousness in the room. However, when the lines of the ceiling are permitted to sweep on apparently into infinity, the room "feels" big.

The accompanying photographs are examples of Daylight Wall applied to a wide variety of buildings. Such design is perfectly adapted to each type because each building was planned for people and people just naturally like lots of light, full view and a feeling of lots of space. That's what nature gives us. That's what a Daylight Wall gives us.



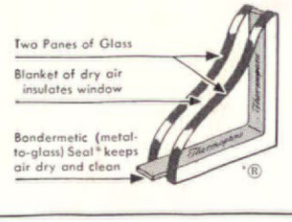
Conference Room, Western Home Office,
Prudential Insurance Company of America,
Los Angeles, California
Architects: Wurdeman and Becket

LOF GLASS

DAYLIGHT WALLS
THAT DON'T BLOCK VISION
THERMOPANE • PLATE GLASS • WINDOW GLASS

FOR WINDOW INSULATION

THERMOPANE* with ½" of dry air hermetically sealed between two panes has twice the insulating value of single glass. This minimizes chilliness, drafts and heat loss at windows. THERMOPANE cuts air conditioning costs by reducing the amount of heat entering during summer. Write for THERMOPANE literature. Libbey•Owens•Ford Glass Company, 4381 Nicholas Bldg., Toledo 3, O.



An important message to everyone concerned with BUILDING

WITH THE HUGE PROGRAM of essential military and civilian building that lies ahead of us, three things—time, labor and materials—are obviously of critical importance.

To everyone concerned with the construction of private homes or public housing, military installations, expanded plant capacity, government facilities and all the other building required for strengthening our defenses, new developments or improvements that will save either time, labor or materials will be of extreme interest.

The purpose of this message is to tell you about one such development that saves *all three.*

It is a revolutionary new type of window that can be *completely installed in a few minutes* instead of the hours required to install many types of conventional windows.



F. C. Russell, PRESIDENT
The F. C. Russell Company • Cleveland 1, Ohio
World's largest manufacturer of All-metal combination windows

It is a complete, finished unit—containing rustproof Lumite screen, glass, weatherstripping and also insulating sash if desired.

It comes factory-painted, fully assembled including the casing and hardware—all ready to place in the window opening. There is no time-consuming, labor-consuming glazing, fitting, altering and painting on the job.

It has no troublesome sash cords, weights or balances. Instead, the windows operate smoothly and easily in vertical slides and lock automatically in both open and closed positions. And because the glass inserts are easily removable and interchangeable, "spares" can be kept on hand for inserting at any time breakage might occur.

For long life and resistance to the elements, it is made of Armco Zincgrip steel, hot-dipped galvanized, Bonderized —or equal—and finished with baked on enamel.

Because of its unique tubular construction, it has great strength yet uses up to *60% less metal* than most conventional types of steel windows.

The double glass insulation permits rainproof and draft-free, filtered-screen ventilation in any type of weather. Insulation from outside noise, as well. And it saves up to ⅓ in precious heating fuel!

This window, known as the RUSCO PRIME WINDOW (Vertical Slide) was developed by The F. C. Russell Company two years ago. Despite its many advantages and superior features, specially-devised tooling and production methods enable us to sell it competitively with the lowest priced window units on the market. Thousands are already in use on private homes and housing projects, and they have been specified on many large installations such as Ladd Air Force Base and Eielson Air Force Base in Alaska; Selfridge Air Force Base, Selfridge, Michigan; and Scott Air Force Base, Belleville, Ill.

We believe that the Rusco Prime Window merits the serious consideration of everyone concerned with building and with the conservation of precious time, labor and essential materials.

For the same convenience and economy advantages on *existing* buildings RUSCO COMBINATION SCREEN AND STORM SASH is recommended. These windows save up to ⅓ on fuel, eliminate changing of screens and storm windows and can be installed without alteration to present windows.

F C Russell

FOR FULL INFORMATION, DEMONSTRATION OR ENGINEERING CONSULTATION ON THE RUSCO PRIME WINDOW, CALL, WIRE OR WRITE **DEPARTMENT 7, MB81, THE F. C. RUSSELL COMPANY, CLEVELAND 1, OHIO**



CONE OF FAILURE ELIMINATED!

Westinghouse Panelboards offer more protection than will ever be required of them

Today, increased power demands place new burdens on electrical distribution systems. In hospitals, for instance, prolonged or unnecessary power outages may take a great toll of comfort, health, life itself.

Panelboards are electrical nerve centers—the points of use for most of your electrical circuits. Westinghouse Circuit Breaker Panelboards are designed to offer maximum circuit protection at these points, and cut maintenance trouble and expense.

Through the use of Westinghouse Nofuze "De-ion®" Circuit Breakers, dangers of overfusing are eliminated. Circuit breakers ride out temporary, harmless overloads. Cut maintenance, too—no fuses to replace. Restore power with a flick of the switch.

But you've also got to look behind the breakers for panelboard quality. Westinghouse Panelboards save time on installation, too. According to a prominent trade publication, such features as phase identification, extended neutral bar indicating trim tabs, angle iron support, can cut installation time as much as 25%.

Specify Westinghouse for the best in panelboards.

For your copy of our new booklet "Panelboard Planning" B-5260, write Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pa.

J-93464

YOU CAN BE SURE.. IF IT'S

Westinghouse

PANELBOARDS

which MICARTA® *advantage will best solve your plastic surfacing problem?*

* when selecting a high pressure plastic laminate that will provide the ultimate in beauty and service for

kitchen counters  sink tops  show cases 

table tops  soda fountains  lunch counters 

furniture tops  bars  desk tops  wainscots 

walls  elevator cab walls  bathrooms 

laundries  playrooms  laboratories 

kick and push plates 

IMPORTANT—Only *high pressure* plastic laminates provide the maximum in wear and durability. Micarta is a *high pressure* laminate.

1/16" SHEETS IN TEN SIZES

For planning with a minimum of waste and the fewest possible seams:

SIZES that are available for immediate shipment from warehouse or mill stock:

30" x 60"	36" x 72"	36" x 96"	24" x 96"
36" x 84"	48" x 96"	30" x 96"	

SIZES available on special order:

30" x 72"	30" x 84"
	48" x 84"

"EDGE BANDING" with Micarta can be done by fabricators using veneer sheets, thus achieving the ultimate in a finished, neat appearance. Edges can also be finished with "Snap-On" metal moldings, wood moldings, and with paint or stain.

CURVES to a radius as small as 3" can be obtained with the use of these sheets.

PRE-FAB BONDED-TO-PLYWOOD PANELS

Under certain conditions, efficiency and economy is obtained by using these panels. Any carpenter can saw, trim, plane and drill them with inexpensive hand or power tools. Thus, your own crew, working under your control and, according to your own timetable, can work and install them.

These pre-fab panels are standard 1/16" Micarta sheets factory bonded to Weldwood plywood, backed for stabilization.

TWO THICKNESSES: ⅞" and 1¼".

FOUR SIZES of the ⅞" panels reduce waste to a minimum.

24" x 96" ———
for commercial counter tops and fronts, kitchen counters and bar tops.

30" x 60" and 30" x 96" ———
standard kitchen counter and sink tops including back splash (30" x 60" for built-in breakfast tables); also commercial counter tops and fronts.

48" x 96" ———
exactly right for walls and other large areas.
(Special sizes also available from mill. Contact nearest USP branch for information.)

EDGES can be finished by painting or staining or with "Snap-On" Metal moldings or solid wood moldings.

CONVEX AND CONCAVE CURVED SURFACES may be obtained by curving or bending the panels to a radius as small as 12" after saw-kerfing the back.

DESIGN-ENGINEERED COLORS AND PATTERNS

Micarta colors are electronically controlled to assure uniformity and match in *every* lot.

Micarta colors and patterns meet the *newest* in design trends. Of special interest are the

Decorator Colors—earthy pastel solids selected by a panel of leading architects.

Truwoods—selected genuine wood veneers permanently protected by Micarta.

CRAFTSMAN GRADE FINISHES

The HIGH GLOSS offers a brilliant, lustrous mirror-like surface.

The SATIN is a pleasant, subdued finish with a minimum of light reflectivity. It is extremely practical, camouflaging finger marks, etc. and is always smooth and uniform.

SERVICE BY A LEADING BUILDING MATERIALS ORGANIZATION

MICARTA in decorative grades is distributed by United States Plywood Corporation and U. S.-Mengel Plywoods, Inc. They maintain stocks in 44 warehouses from coast to coast and there is always a representative near you for counsel and service. Micarta is also available to building contractors and the general public through local authorized lumber dealers throughout the nation.

THE PRESTIGE OF A GREAT NAME – WESTINGHOUSE

Architects' clients and builders' customers will both appreciate the quality assurance conveyed by the great trade mark—

WESTINGHOUSE

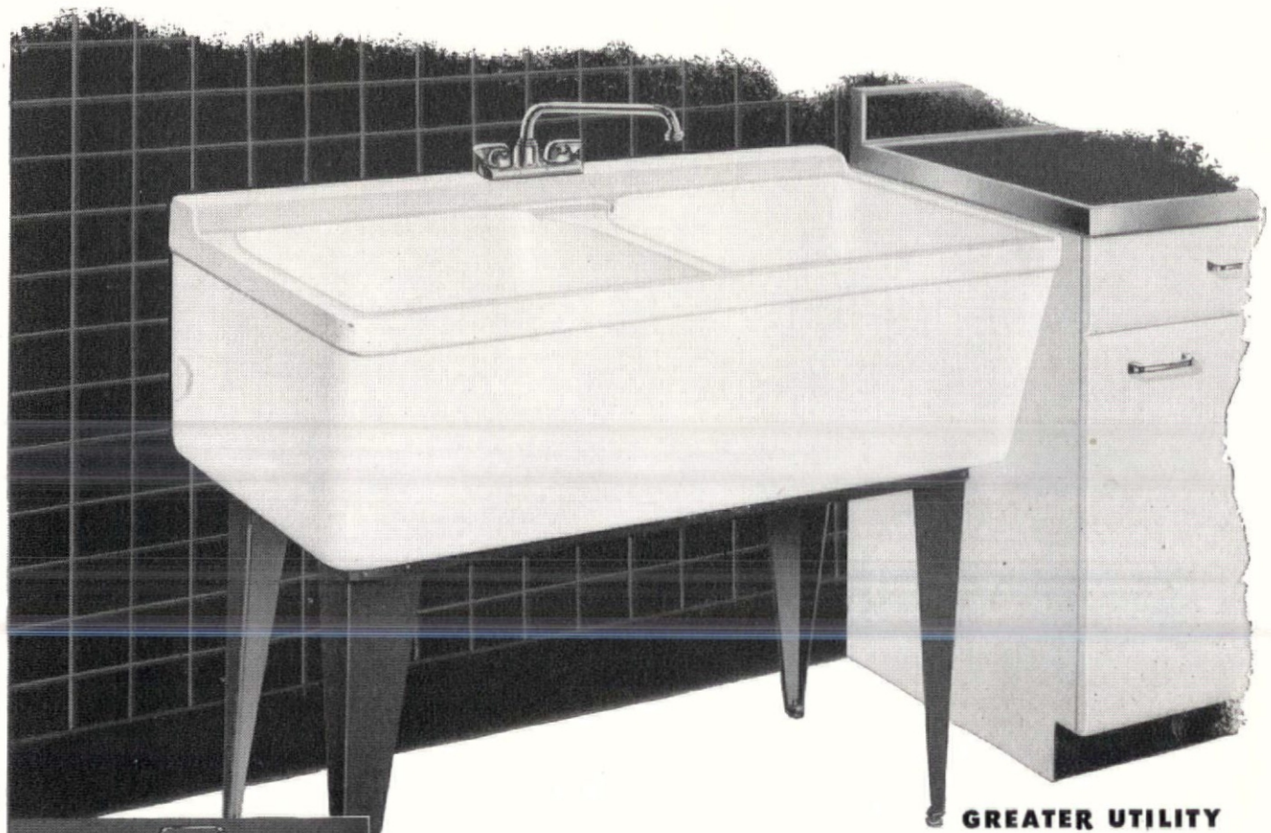
MICARTA

is manufactured by Westinghouse and sold in decorative grades only by UNITED STATES PLYWOOD CORPORATION and U. S. - MENGEL PLYWOODS, INC.

SPARKLING WHITE

CRANE *Laundrette*

BRINGS BATHROOM BEAUTY TO THE LAUNDRY





Single-basin *Laundrette* available in 22 x 25 in. size

Crane *Laundrette* is an advancement in laundry tub design that meets the requirements of the modern home. Sparkling white and meant to be seen, *Laundrette* matches the styling of new home appliances.

Made of *Duraclay,* the exclusive Crane vitreous glazed earthenware used in hospital fixtures, *Laundrette* resists abrasion, acid, stain and thermal shock. It has a smooth-as-glass surface that wipes clean with a damp cloth. Legs are steel, painted black, and have self-leveling screws. Two sizes: 36 x 25 in. and 42 x 25 in. Consult your Crane Branch or Crane Wholesaler.

GREATER UTILITY



Laundrette is ideal for big family washes—for sudsing the finest silks. Left-hand compartment has molded-in scrubbing board.

EXCLUSIVE CRANE *Dial-ese* CONTROLS

operate at a finger's touch—help reduce wear and consequent dripping. The end of the chromium-plated swinging mixing spout is threaded for hose.



CRANE CO.

GENERAL OFFICES 836 S MICHIGAN AVE. CHICAGO 5

VALVES • FITTINGS • PIPE
PLUMBING AND HEATING

MONOLITHIC LIPTON TEA BUILDING TESTIFIES TO GPX EFFICIENCY



The new Lipton Tea Building in Galveston, Texas, is probably the finest example of monolithic concrete construction in the country today with respect to its smooth form finish. It bears mute testimony to the labor-saving efficiency and concrete form economy of GPX Plastic-faced Plywood.

In concrete form use, GPX's satin-smooth, armor-hard plastic surface reduces "grinding and pointing" to a minimum. In the case of ceilings, plastering can be eliminated entirely.

The number of re-uses of GPX Concrete Forms is determined solely by the care with which it is handled, and the cutting necessary for pipes and outlets. GPX Concrete Forms can, under special circumstances, be used literally hundreds of times.

Here's the reason why GPX out-performs all other materials for concrete form use, and hundreds of other industrial and construction applications:

GPX, the modern miracle material, combines the rigid lightweight strength of plywood with the rugged durability and smoothness of phenolic resin plastic. Made of selected Fir veneers and solid cores, bonded and surfaced with phenolic resin, GPX panels are formed under heat and pressure. As the plastic overlay flows, condenses and sets, it forms a thick, glossy-smooth, armor-hard surface that is part of the plywood itself . . . a surface that will not crack or chip.

Investigate GPX today. It's a quality product of Georgia-Pacific, with practically unlimited application for building, in industry and on the farm. For further information about GPX Plastic-faced Plywood, write on your company letterhead, or fill in and mail the coupon below.

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Treated lumber and timbers
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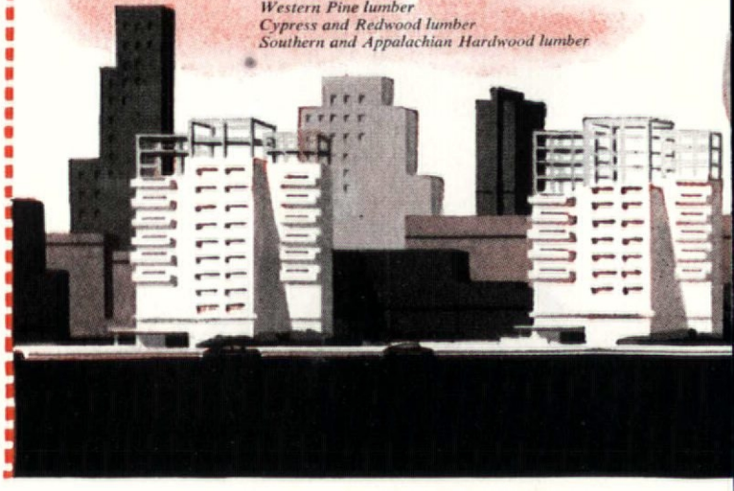
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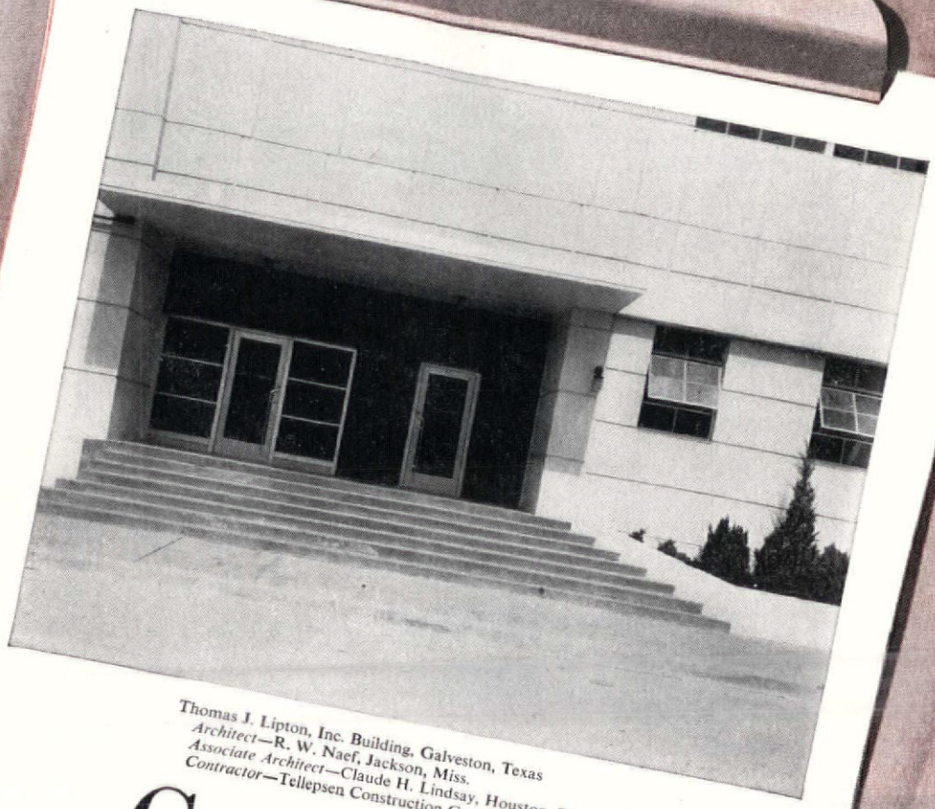
Company Name .....

Address .....

City.....Zone.....State.....

Your Position .....





Thomas J. Lipton, Inc. Building, Galveston, Texas
Architect—R. W. Naef, Jackson, Miss.
Associate Architect—Claude H. Lindsay, Houston, Texas
Contractor—Tellepsen Construction Co., Houston, Texas

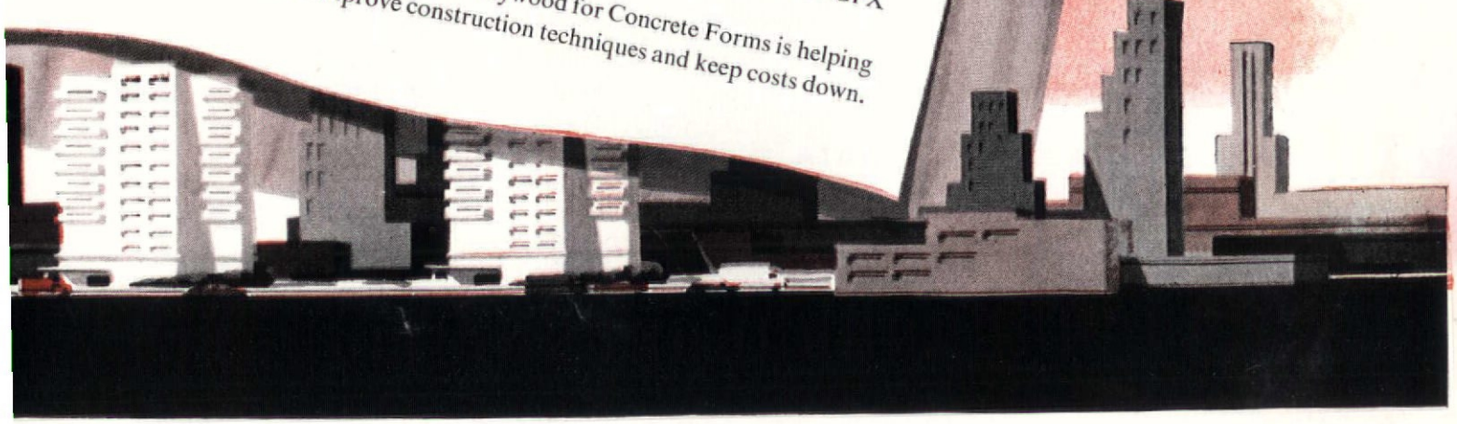
Case Study

The Lipton Tea manufacturing plant in Galveston, Texas, involved 200,000 square feet of contact surface form work, most of which was exposed. 32,000 square feet of GPX Plastic-faced Plywood was used to accomplish the forming job.

GPX forms were used 5 times in pouring floor and roof slabs. These forms were re-used 8 times in the wall forms. The surface obtained with GPX proved to be extremely smooth, with rubbing confined primarily to joints and intersections.

After completing the Lipton building, Tellepsen used some of their GPX forms on another job, making a total of 23 pours, and reported that the GPX panels still had plenty of serviceable life left.

Georgia-Pacific's GPX Plastic-faced Plywood for Concrete Forms is helping progressive contractors improve construction techniques and keep costs down.



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FIBERGLAS* Roof Insulation



It's low in thermal conductance

It's long lasting... It's Economical

JOB DATA ON ANOTHER FIBERGLAS INSULATED ROOF

Building: FORD MOTOR COMPANY—Body Stamping Plant, Hamburg, N. Y. (Buffalo)

Architect: Albert Kahn Associates.....Detroit

General Contractors: Darin & Armstrong.....Detroit
Bryant & Detwiler Co.....Detroit

Roofing Contractor: Arrow Sheet Metal Works, Inc.....Buffalo

Roof Deck: Steel Deck

Roof Insulation: Fiberglas Roof Insulation—approximately 1,000,000 sq. ft. of 1" thick material

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ROOF INSULATION

*Fiberglas is the trade mark (Reg. U. S. Pat. Off.) of the Owens-Corning Fiberglas Corporation for a variety of products made of or with fibers of glass.

Low Thermal Conductance—When you specify the heat conductance required for roof insulation you make unmistakably clear the degree of heat protection you wish. We'll gladly certify to the low "C" values of Fiberglas Roof Insulation as shown:

Thickness:	½"	¾"	1"	1¼"	1½"	2"
Heat Conductance:	.50	.33	.25	.20	.17	.13

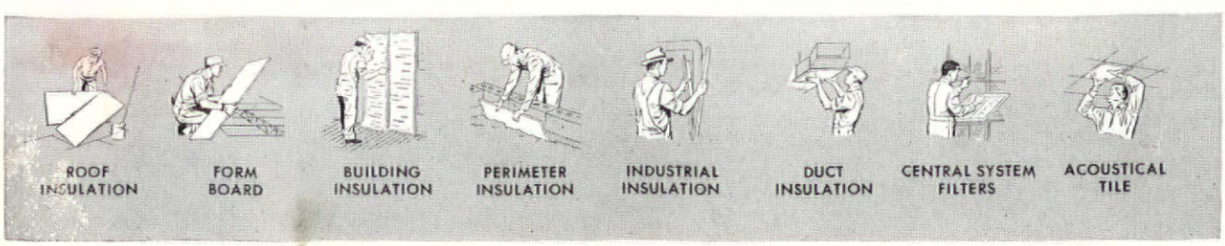
Long Lasting—Will not rot or decay, swell or shrink—fibers of glass are unharmed by possible dampness. Will not deteriorate from exposure to either the elements or normal roof traffic. Durability and low maintenance costs are assured.

Competitively Priced—For equal heat resistance its cost, installed, usually equals and in some instances runs below the comparable cost of less durable roof insulations. Light in weight, easy to cut and handle, it is rapidly installed by standard methods.

With rapid installation and conservation of fuel again gaining in importance, you can specify Fiberglas Roof Insulation with confidence. For complete information write for "The Design of Insulated Roofs" (a 36-page manual) or refer to Sweet's Files—Architectural.

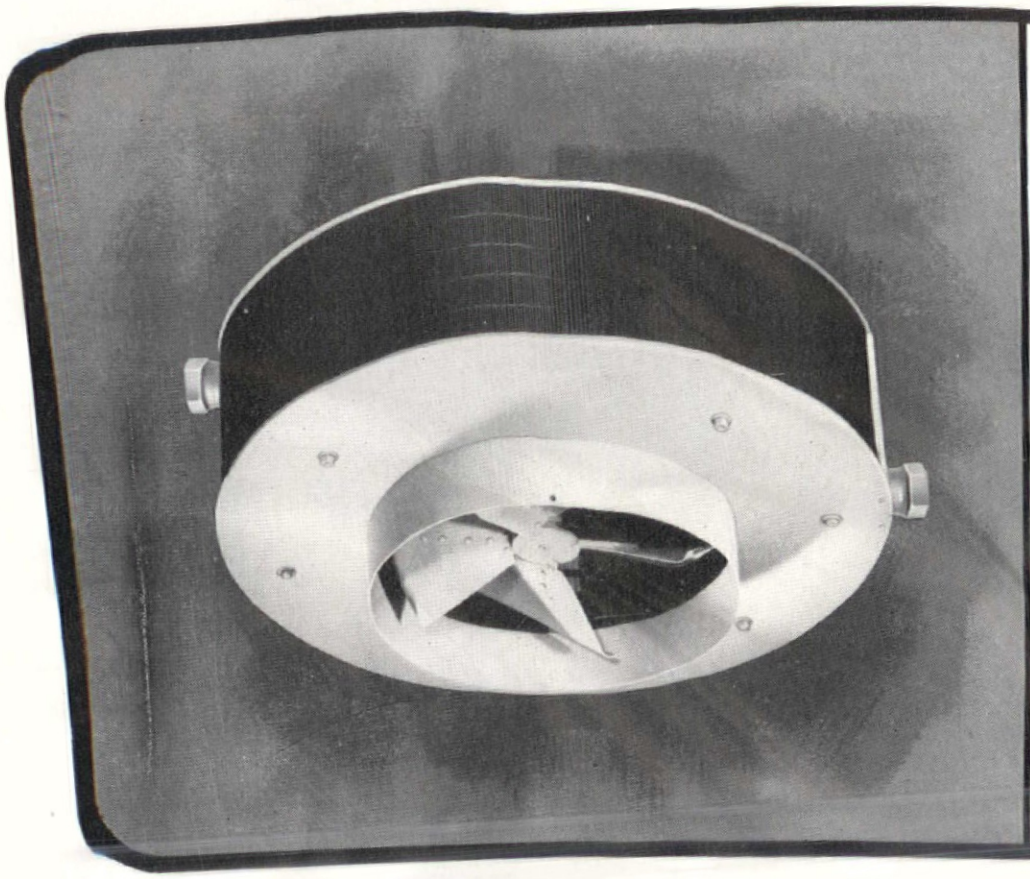
Owens-Corning Fiberglas Corporation, Dept. 67-H, Toledo 1, Ohio.
Branch Offices in Principal Cities.

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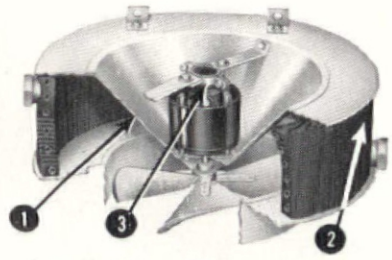




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dunham design features you'll want to see



1. sturdy motor support cone protects motor from excessive heat, dust and other impurities.

2. improved header design requires fewer solder joints; assures uniform steam distribution; eliminates air pockets.

3. resilient motor mounting insulates motor vibrations, avoids transmission of noises through piping.

throw heat where you want it
assure quieter operation
save on installation expense

You're looking at . . . and into . . . Dunham's new Vertical Discharge Unit Heater. Designed inside and out to assure continued delivery of original rated capacities, these new heaters can maintain perfect balance between air volume, velocity, and final outlet temperatures. They keep customers comfortable and contented because they:

throw heat where needed—Motor support cone effectively funnels air from heating element to propeller fan; selection of air diffusers assures proper directional control of heat throw.

assure quieter operation—Motors are rubber mounted to minimize vibration and noise. Correctly pitched fan blades operate at relatively slow speed for quiet operation.

save on installation expense—Supply and return tappings located on sides of heater for simplified horizontal piping hook-up. Fewer fittings required.



Here are the Facts

If you are engaged in defense or essential civilian production, it will be to your advantage to know more about these heaters. Bulletin 1301-5 contains complete information. Write for your free copy.

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For Better Living



. . . and Hotpoint Leads in Modern All-Electric Kitchens and Home Laundries!

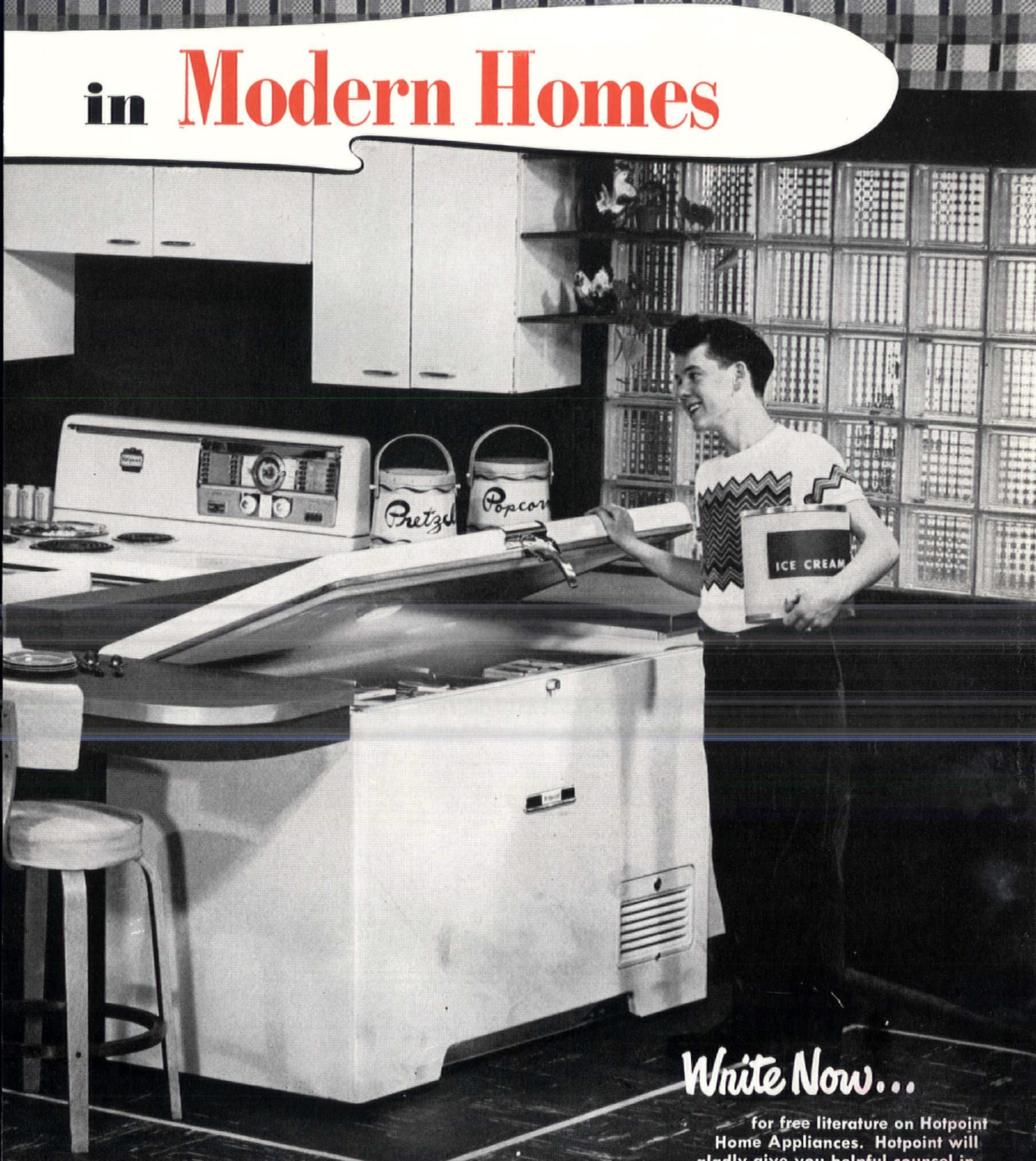
In large homes and small, Hotpoint all-electric kitchens and home laundries are bringing millions of American families closer together. Mothers have more free time to spend with their families, shopping, visiting or just relaxing. Modern homemakers are welcoming a relief from the tedious, time-consuming kitchen and home laundry chores which Hotpoint Home Appliances take over and do **automatically.**

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A good example of progressive design in a commercial building: George Fuller Chevrolet Company, Tulsa, Oklahoma. Decorative interior paneling and exterior siding are "Century" Corrugated Asbestos-Cement Sheets. Architect-Engineer: J. Gordon Turnbull, Inc. Chicago—Kansas City—Los Angeles.

Smart... modern... economical...

"CENTURY"® CORRUGATED ASBESTOS-CEMENT SHEETS

A structural surface covering that opens new horizons for the designer—permits new economies for the builder!

The clean-lined "Century" Corrugated Asbestos-Cement Sheets are structurally strong, naturally attractive; can be used for both interiors and exteriors; for roofs and side walls; as decorative paneling. And, though "Century" Asbestos Corrugated never needs protective painting to preserve it, it takes decorative colors well.

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Next time you have a problem involving modern design and economical construction, consider "Century" Corrugated Asbestos-Cement Sheets: for stores, theaters, industrial structures, public buildings, residences. We'll be glad to send complete specifications with application data on request.

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Distinctive G-E Textolite tops enhance the décor of the Holiday House Restaurant, Chicago. (Installation by Pascal Equipment Co., Inc.)





Patrons of the ultra-modern Holiday House Restaurant in Chicago dine in style—thanks largely to the distinctive and superior styling of General Electric Textolite table tops. It was for features such as these that G-E Textolite tops were awarded the Fashion Academy Gold Medal for 1951.

The Holiday House's decorator selected these tops as the result of a search for "something different." He found what he wanted among the wide variety of *original* G-E Textolite colors and patterns.

Builders and architects will find General Electric Textolite tops ideal for all surfacing requirements—private kitchens or commercial installations. Their good looks are matched by their ability to withstand the wear and tear of hard daily usage.

See the G-E Textolite Catalog in Sweet's Architectural File for more details, or mail coupon for a free pattern sheet in full color.

* Reg. U. S. Pat. Off.

You can put your confidence in

GENERAL ELECTRIC

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General Electric Company, Section U-3
Chemical Division
Pittsfield, Massachusetts

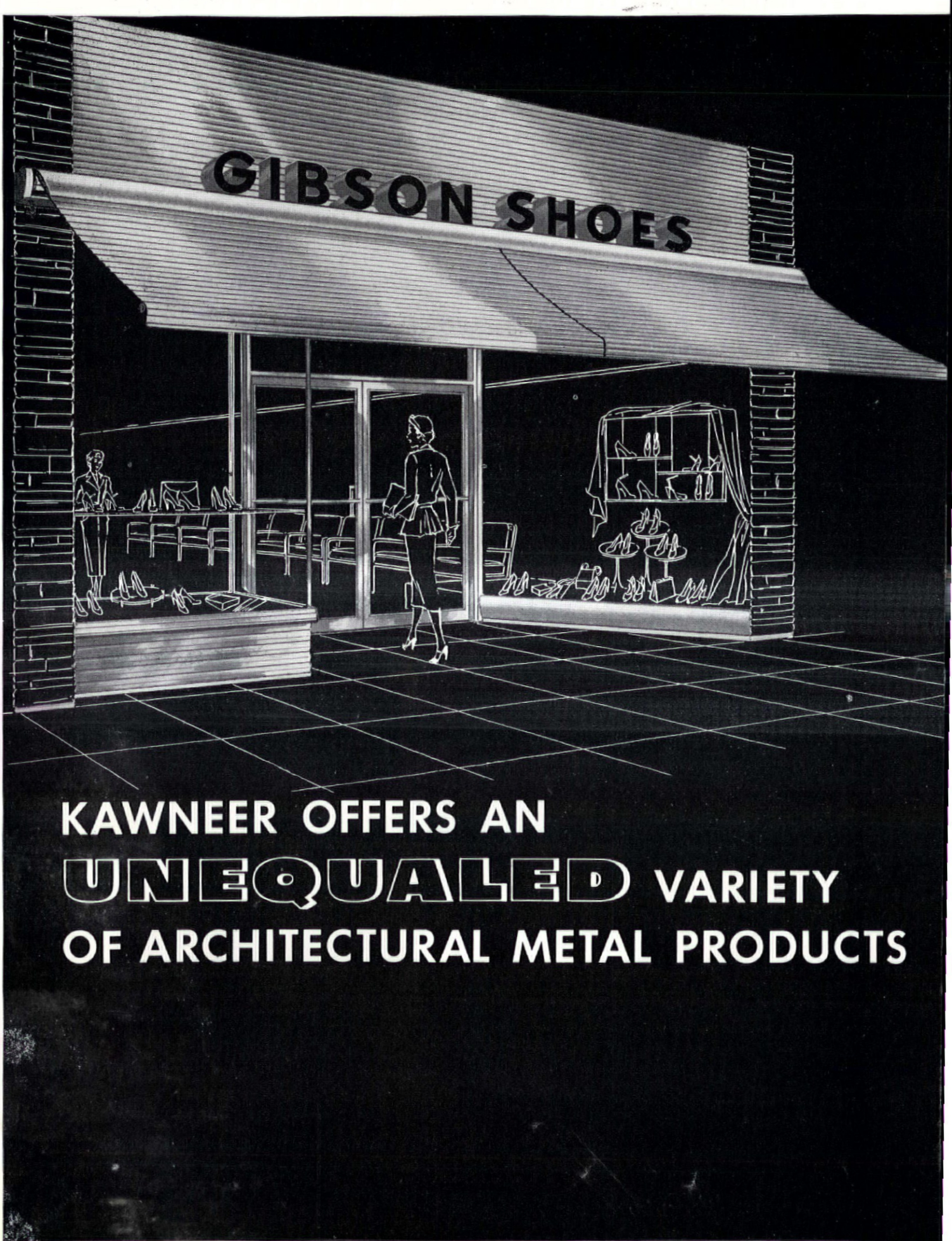
Please send me, free, a pattern sheet showing the 1951 G-E Textolite top designs in full color.

Name_____

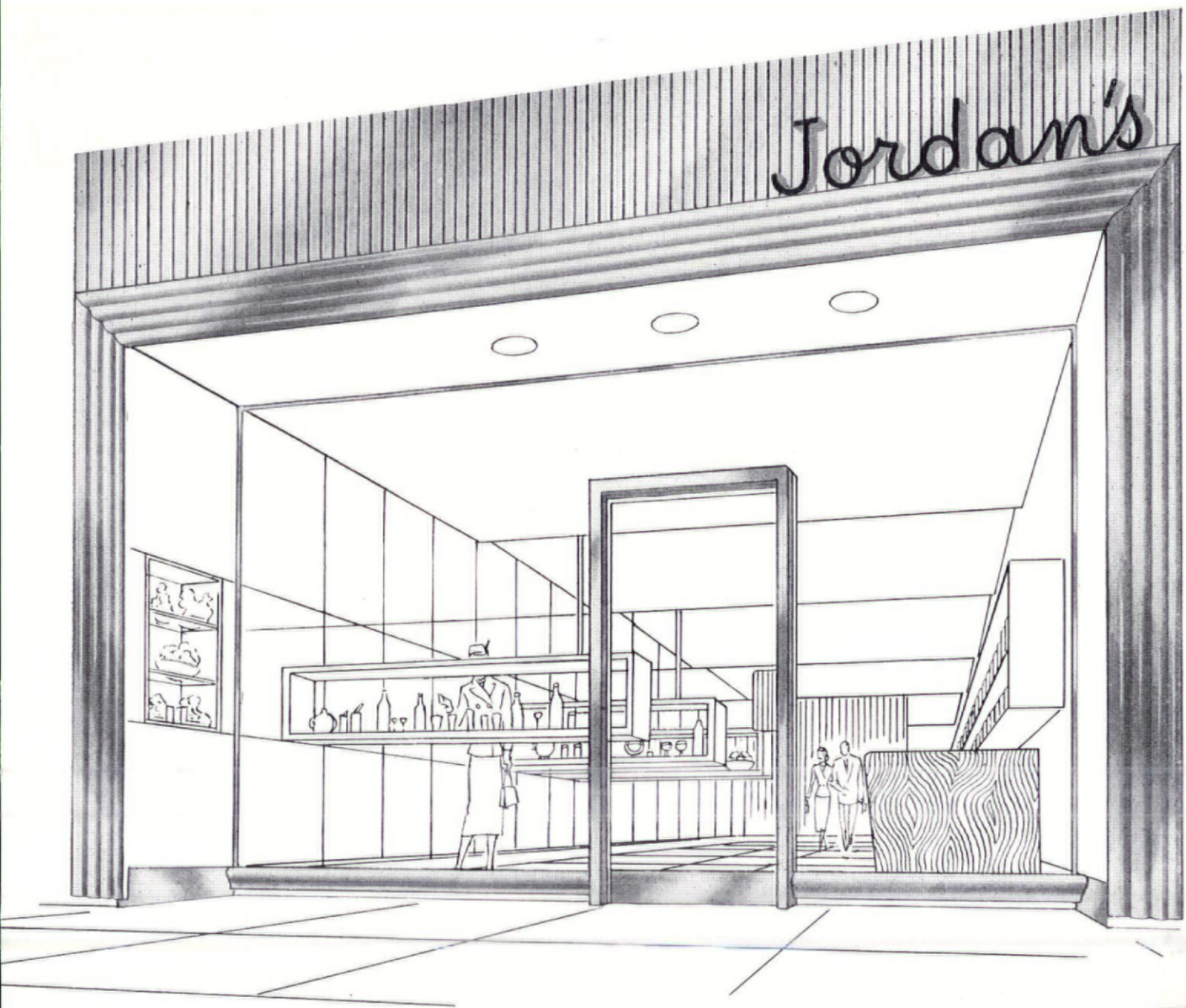
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KAWNEER OFFERS AN UNEQUALED VARIETY OF ARCHITECTURAL METAL PRODUCTS

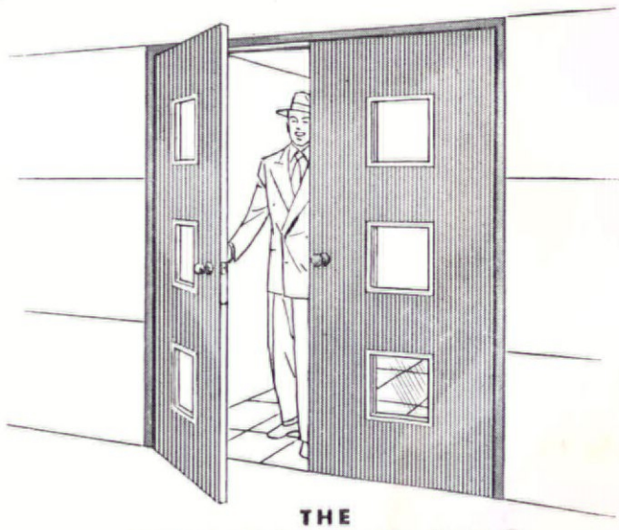


AND THEY'RE UNEQUALED IN MODERN STYLING AND ENGINEERING . . .

• You can solve almost any requirement for architectural metal products by the imaginative use of stock Kawneer products.

The Kawneer Line comprises a comprehensive selection of glazing assemblies . . . trim . . . show case doors . . . entrances . . . Zourite aluminum facing material . . . all-aluminum flush doors . . . awning boxes . . . awning hoods . . . all-aluminum roll-type awnings.

Each unit has been styled to reflect the rich individuality of more expensive made-to-order assemblies — while bringing you reduced costs through lower price, prompt availability and faster installation.



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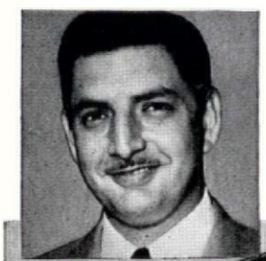
For information write:

Dept. MB 79, 1105 N. Front St., Niles, Mich.

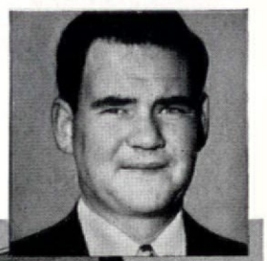
or Dept. MB 79, 930 Dwight Way, Berkeley, Cal.

Take it from these Successful builders...

Kelvinator-equipped Electric Kitchens are "Tops" with Them and their Tenants!



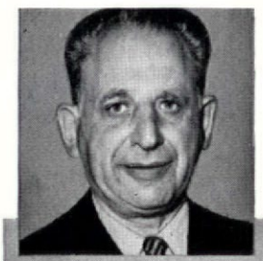
Robert L. Blum



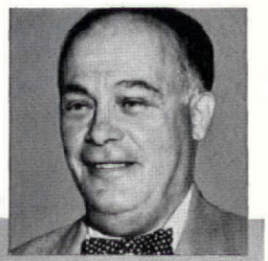
Milton Schwartz



Chicago points *to the 2930 Commonwealth Building as a wonderful place to live. Chief among the reasons are complete air conditioning plus electric kitchens with new Kelvinator Electric Refrigerator and Range in each of the 52 apartments.*



Joseph Leeb



Sigmund Dubin

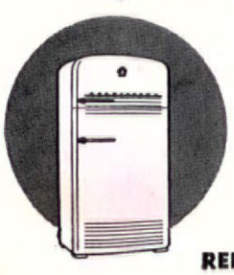


New Pottawattamie Apartments *in Chicago, notable for their "thoughtfulness" regarding tenants, feature autotronic elevators, soundproofed walls, basement freezer lockers . . . and electric kitchens with Kelvinator Refrigerators and Ranges in all 45 apartments!*

WE ASKED Mr. Blum and Mr. Schwartz why they chose Kelvinator. They said: "For the best in today's living, in a building so completely modern, naturally our kitchens have electric equipment. We chose *Kelvinator* refrigerators and ranges because, as our records tell us, they give the finest performance and save many dollars."

We asked Mr. Leeb and Mr. Dubin the same question. They said: "Our experience with Kelvinator in past projects has been completely satisfactory. Extremely low maintenance cost, smartness of Kelvinator designs, and the certainty of high user satisfaction led us to choose Kelvinator again."

Assure these same important advantages for *your* new projects . . . specify dependable Kelvinator products. Get full information from Dept. AF, Kelvinator, Division of Nash-Kelvinator Corporation, Detroit 32, Michigan.



Kelvinator

DIVISION OF NASH-KELVINATOR CORPORATION, DETROIT 32, MICHIGAN



REFRIGERATORS, RANGES, HOME FREEZERS, WATER HEATERS, AIR DRIERS... *Electric, of course!*

Kelvinator, featured exclusively nationwide  *in the Good American Home Program.*

Million Home Starts Seen, But Outlook Is Less Private Building

The creeping revolution being wrought in the building industry by partial mobilization grew steadily more apparent. Although new construction continued to exceed 1950 levels, the margin was dwindling *(see table)*. Public building was gaining so fast some economists viewed it as the greased chute to socialism for the industry. Private building's share of U. S. construction continued to shrink. Restrictions were ending the boom in commercial building. Expenditures for Government industrial construction were four times those of a year ago.

Even before Congress could carry out its evident intention of relaxing credit curbs on housing, officials used mobilization controls to create machinery to thwart the new wave of home building they feared might result. Home building along with every other kind of construction was finally clamped in mobilization's strait jacket: the Controlled Materials Plan *(see below)*.

The embarrassing fact was that home building had shown surprising strength considering its credit and mortgage hobbles. Even cautious, precise H. E. "Pat" Riley, top Government housing statistician, forecast housing starts will reach 900,000 to 1,000,000 this year. For 1952 when materials and manpower might reach the scarcest, mobilizers wanted to make sure they had a firm grip on housing's steering wheel and brakes, no matter what Congress did. In July, private housing starts as reported by BLS fell to 86,000 (82,800 private, 3,200 public). For private homebuilding, that was 5% below the June level, and a big 41% below July 1950 *(see table, p. 43)*. Still, another 330,000 starts (66,000 a month) would produce a million house year.

NEW CONSTRUCTION ACTIVITY
(expenditures in millions of dollars)

	July			1st 7 Months		
Type	'50	'51	% Change	'50	'51	% Change
PRIVATE						
Residential (non-farm)	1269	922	—27.3	6575	6180	—6.0
Industrial...	84	191	+127.4	513	1086	+111.7
Commercial	116	119	+2.6	628	875	+39.3
TOTAL* ..	2016	1858	—7.8	10957	11796	+7.7
PUBLIC						
Industrial...	18	95	+427.8	91	446	+390.1
Military	10	102	+920.0	62	417	+572.6
Residential..	24	55	+129.2	199	306	+53.8
TOTAL* ..	680	932	+37.1	3704	4895	+32.2

* Minor components are not shown in table, hence total exceeds sum of parts. Data from Depts. of Commerce and Labor.

Deflation was an immediate worry. Some economists even figured the nation was in for a stiff jolt of falling prices, sagging business next year after steel and aluminum production catches up to the need. Building materials prices already had dipped. Home sales were stuck in a slump.

In the long pull, however, inflation still dominated the U. S. economy.

LAST MONTH'S WASHINGTON DIARY

7/1 NPA issues Copper Order M-74, prohibiting use of copper or copper-base alloy in 30 building items including doors, frames, sills, grilles, railings, fittings

7/2 NPA adds 20 more field offices to 37 already authorized to act on construction cases

7/9 Eleven Federal agencies, including Defense Department, agree to adopt uniform construction standards embodied in national plumbing code, ACI standard building code, lumber manufacturers' "design specification for stress grade lumber," and Steel Construction Institute's "specifications for design, fabrication and erection of structural steel"

7/10 NPA, Commerce Department and HHFA issue report endorsing proposed National Plumbing Code, officially described as "to standardize and simplify plumbing practices and thus effect a tremendous saving in critical materials

7/10 Construction Industry Advisory committee discusses proposed sweeping changes in M-4 order with NPAdministrator Fleischmann, who notes the time has come to ease restrictions on building using small amounts of critical metals

7/11 NPA delegates power to eight Government agencies to process applications for construction under CMP

7/13 NPA announced new form CMP4-C would be required for all allotments for fourth quarter construction, but gave industry (including firms on the West Coast) only seven days to file completed applications in Washington

7/27 DPAdministrator Fleischmann unveils fourth quarter CMP allotments of steel, copper, aluminum

7/30 NPA begins CMP compliance check of 1,000 metal using companies

7/30 Approvals of fast tax amortization reach some 70% of $8,461,569,605 being spent for 2,882 new or expanded plants

CMP ORDERED FOR ALL CONSTRUCTION ON OCT. 1

Across the nation, architects, contractors and builders barked in frustration at the tangle of construction controls. Said a big Los Angeles builder: "We've got lawyers working overtime on all this red tape. So have the steel companies. But how can the small builder afford to get all the legal advice he needs on how to proceed properly. It's a helluva mess, believe me." In Atlanta, an exasperated architect said: "Nobody knows anything at the NPA field office. They're always waiting for 'changes next week'." Contractor Richard Cahill of San Francisco just threw up his hands: "the confusion is far too confused for any example."

Orders wholesale. Early this month, NPA fed the harrassed industry another big dose of the same medicine. After nearly a month of last minute changes, it unwrapped its scheme for putting all building under the Controlled Materials Plan starting Oct. 1 (for details, see table, p. 38). Despite a plethora of gobbledegook in eight separate orders NPA used to make the switch, the new system made sense to most building men. Observed one Washington construction expert: "It would be a fine system if there was any steel to go with it." Chief reasons:

- NPA had finally heeded the building industry's months-old advice, put restrictions squarely on the basis of how much scarce metal a building used.

- It made good administrative sense by getting control over most small building projects out of officialdom's hair. Enforcement of CMP controls over peanut-sized building would be impossible, anyway.

Home builders, for instance, were given the right to allot themselves materials for as many 1 to 4 family homes as they dared build amid the mortgage crisis and sagging market subject to stringent economy rules for each house. (Multi-unit housing was subject to complete CMP control.) No aluminum would be permitted in small house construction.* A ban on structural steel would mean, for instance, no window lintels for brick houses. But NAHB thought builders would not fare too badly with a little ingenuity. Likelihood of more use of wood was duly appreciated by the National Retail Lumber Dealers Association which applauded the order.

Total control. Subject to a different but also stiff set of limits, contractors could

* This did not include fabricated building materials like aluminum window frames, however, which are subject to an entirely different set of controls. The Aluminum Window Manufacturers Association reported these remain available in all types, with prospects for "reasonable" supply next year.

THE NEW RULES: Construction Industry Comes Completely Under CMP

On Aug. 3, the National Production Authority revoked all its old regulations controlling construction, issued eight new orders. Net effect is to bring building completely under the Controlled Materials Plan on Oct. 1. The rules:

TEMPORARY RULES (Aug. 3—Oct. 1)

NEW CONSTRUCTION

INDUSTRIAL — May begin without NPA approval only if not more than 25 tons of steel, 2,000 lbs. of copper, 1,000 lbs. of aluminum will be required *to complete.*

RESIDENTIAL (1 to 4 family units) — No restrictions except houses using more than self-certification permits must have approval on Form CMP 4-C for construction after Sept. 30.

(multi-unit structures) — May begin without Government approval only if structure can be *completed* with not over 25 tons of carbon steel, 2,000 lbs. of copper. No use of aluminum or alloy or stainless steel permitted. Projects requiring more material must wait HHFA approval in the 4th quarter.

RECREATIONAL — Same as permanent rules (*see below*).

ALL OTHER (commercial, public, religious) — May begin without NPA approval only if structure can be completed with not over 2 tons carbon steel, 200 lbs. copper, no aluminum, alloy or stainless steel.

BUILDING UNDER CONSTRUCTION

Must halt after Sept. 30 unless materials to complete are already delivered, or

1. Required materials may be self-certified, or
2. Allotment is granted by Government.

PERMANENT RULES (After Oct. 1)

For Small Projects:

SELF-CERTIFICATION (by prime contractor)

	Metals per project per quarter		
	STEEL	COPPER	ALUMINUM
INDUSTRIAL	25 tons (including not over 2½ of alloy)	2,000 lbs.	1,000 lbs.
	No self-certification of stainless steel.		
RESIDENTIAL	*—using steel water pipe*		
1 unit per structure	1,800 lbs.	35	none
2 units per structure	3,500 lbs.	65	none
3 units per structure	5,100 lbs.	100	none
4 units per structure	6,500 lbs.	125	none
	—using copper pipe		
1 unit per structure	1,450 lbs.	160	none
2 units per structure	2,750 lbs.	300	none
3 units per structure	4,100 lbs.	450	none
4 units per structure	5,200 lbs.	575	none
	No self-certification of structural, alloy, stainless steel or aluminum.		
RESIDENTIAL (multi-family units)	No self-certification permitted.		
RECREATIONAL	No self-certification permitted.		
ALL OTHER (commercial, public)	4,000 lbs.	200 lbs.	
	No self-certification of alloy or stainless steel.		

For Big Projects:

Projects using more than self-certification limits must apply to appropriate Government agency on CMP 4-C, await approval before beginning construction.

Recreational Construction — May proceed without permit only if *completion* will require no more than 2 tons of carbon steel, 200 lbs. copper, no alloy or stainless steel, no aluminum. But ban on self-certification means applications or black market will probably be only way to get metal.

Use of Copper & Aluminum — Old M-4 prohibitions continue, but some items removed from prohibited list. Copper items on prohibited list may not be used without permission, even though already on hand. Construction prohibitions do not cover "Class B" products, e.g. copper faucets, door knobs, aluminum window frames.

Exceptions, & Adjustments — May be sought from NPA in Washington by persons prohibited from starting recreational jobs, or barred from using copper or aluminum. Requires filing both Form NPAF-24A and CMP-4C. For exceptions on materials consumption above self-certification, or allotments denied or curtailed, apply under CMP Regulation 6.

Appeals — May be filed through materials claimant agency under NPA Regulation 5 to NPA Appeals Board.

Alterations, Modernization — Comes under general commercial self-certification limit of 2 tons of steel per building per quarter (in lieu of 25¢ per sq. ft.). This does not include maintenance and repair, however.



Harris & Ewing

ADVANCE CONFERENCE ON NEW CONTROLS was held in mid-July by business, government, labor chiefs under aegis of U. S. Chamber of Commerce construction mobilization subcommittee. Seated (l/r): Frank R. Creedon, ass't NPAdministrator for facilities & construction; Subcommittee Chairman Ralph Walker, AIA; Walter C. Skuce, ass't NPAdministrator for CMP. Standing (l/r): Joseph D. Keenan, secretary-treasurer of AFL Building Trades Dept.; William C. Truppner, Skuce's assistant; and Norman P. Mason, North Chelmsford, Mass., chairman of Chamber's construction-development committee.

allot themselves steel, copper (but no aluminum) for schools, office buildings, churches. Builders of industrial plants could self-certify a little aluminum. But big projects would be completely controlled by 19 Federal agencies to which NPA farmed out the job of ruling on individual allotments. Except for top priority defense work like atomic energy plants and military construction the awful truth looked painfully obvious: lack of steel meant many projects (probably including even plants with Government approval for quick tax write off) would not get materials during the fourth quarter. The NPA hierarchy shied away from saying they would be denied. They would be "deferred" until early 1952.

Half-holiday. And there were jokers. When their meaning sank in, the building industry would squawk loud, but probably unavailingly. All the old rules were repealed. CMP allotments and self-certification would not be effective until Oct. 1. What happens meanwhile? New construction—not yet approved by NPA—would be forced to take a half-holiday. No start would be legal unless the amount of scarce metals needed for delivery after Sept. 30 did not exceed self-certification limits.

On big projects already underway where more materials would be delivered later, construction could not continue after Sept. 30—even if NPA approval had been given once before, without going through the mill of Government approval all over again. "Projects like that we'll approve," promised NPA Counsel Henry Heymann, explaining the red tape to newsmen in New York. "We don't want a lot of half-finished building around."

Red tape had reached a new pinnacle.

Big Squeeze on Structural Steel, DPA Warns; Steel Men Blame Overordering

The plain fact was that U.S. industry was trying to use more steel than it had. Everybody, it seemed, wanted to do everything at once. Samples: The electric power industry wanted to expand its capacity 40% in the next three years—more than it has expanded in the last 50 years. Railroads had stormed the market for more freight cars, tankers and even passenger cars than they had bought since the war. The oil and gas industries announced they must have long lines of big steel pipe to carry supply to market lest the nation face a famine of both natural gas and gasoline.

For the construction industry, rushing to build everything from billiard ball factories to aircraft assembly lines, the sad news was that structural steel had become one of the steel items in shortest supply. Almost all the experts agreed there wasn't enough to go around, that the crisis would continue at least until the second quarter of next year.

Wolf cries? But you could get varying versions of *just how short* steel supply really was. One came from men like DPAdministrator Manly Fleischmann who had to make out a case for a controlled economy. Fleischmann said steel demand for the last three months of this year totaled 223% of available supply. For structural steel, claimants wanted nearly double probable supply (1,300,000 tons), he said.

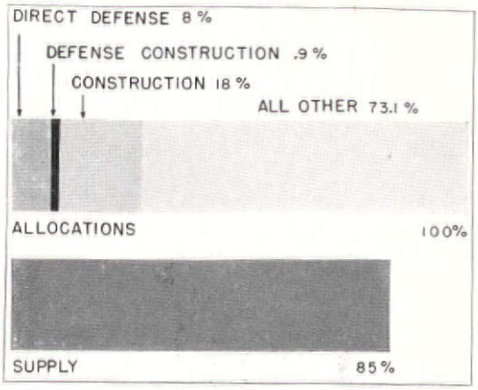
The other version came from steel men outside the government and (surprisingly) from some high in mobilization councils. Chairman Eugene G. Grace of Bethlehem Steel Corp. cried: "There's plenty of steel for a peace-time economy and the defense job. If customers get all the steel they're asking for under CMP, they will be vastly overstocked by the end of the year." Added the head of the nation's second largest steel company: All DPA's talk of "shortage" was causing even his regular customers to want twice as much steel as they ever used before, even during war. In short, said Grace, the month-old CMP had created "chaos and confusion" in the steel industry, was greasing the path (by self-certification) for black markets on a scale never before seen in the U. S.

Crabbed *Iron Age:* "Those who thought they could draw a line through the steel market and make it half slave and half free are finding how wrong they were."

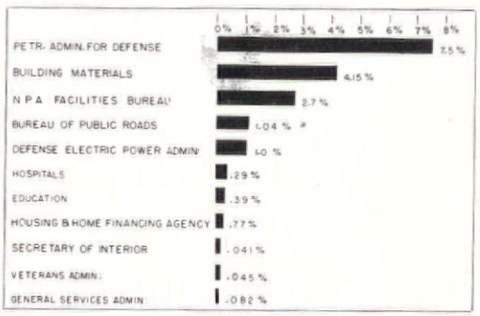
Where it counts. Across the country, there was plenty of confusion in the steel market, but delivery delays and shortages also were beginning to stall erection of schools, hospitals, offices. In Dallas construction on the 11-story Gibraltar Insurance Co. building had been delayed for months by slow deliveries on structural steel. "I don't know and can't find out just when we are getting it," sighed Contractor J. W. Bateson. But Williams & Wagner, small Dallas general contractor specializing in 10,000 to 30,000 sq. ft. warehouses, insisted "there's no steel shortage. We could buy 100 tons of Belgium steel in Dallas tomorrow if the government would let us."

In Oklahoma City, Contractor Robert E. McKee said he had been held up on a big veterans' hospital since May by lack of steel. In Atlanta, Georgia Tech's new library had a DO rating for structural steel and wrought iron, but was stymied for lack of reinforcing steel. Contractor J. A. Jones reported work on 990 public housing units was down to a snail's pace because steel trickled in 25 to 30 tons at a time. Another type of snafu involved the nonessential job approved early in the year on a hardship basis by lenient NPA, now half built but unable to find steel to complete without DO aid it could not get. Denver's Civic Theater, for instance, won a hardship rating, but was stalled with foundation and footings poured for lack of a few final beams and girders.

In Detroit, delays were general, though no projects were stopped cold—yet. When the Detroit School Board asked for a separate steel bid for a high school addition, it got no offers. Ex-President Walter I. Couse of the Associated General Contractors noted that much of available steel was reconverted, bore a stiff price tag. Several Detroit hospitals had gone as far afield as Louisiana for steel, at $100 a ton more.



CONSTRUCTION'S SHARE of fourth quarter steel is about same as it used in 1950, but DPA took same chance that caused confusion in third quarter, allocated 15% more steel than supply.

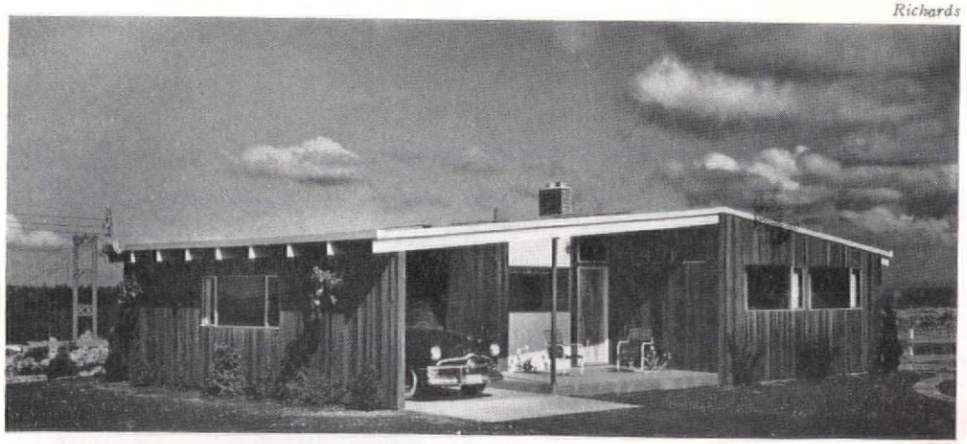


PETROLEUM EXPANSION got lion's share of construction's 18% steel allocation. HHFA got only 0.7% to reallocate for housing.

Jumble pie. When DPA's potent but unpublicized requirements committee sliced up the steel pie for the fourth quarter, military take was not the culprit. Only 10% of the available steel supply went into direct defense output such as tanks, ships, guns and planes. Overall, construc-

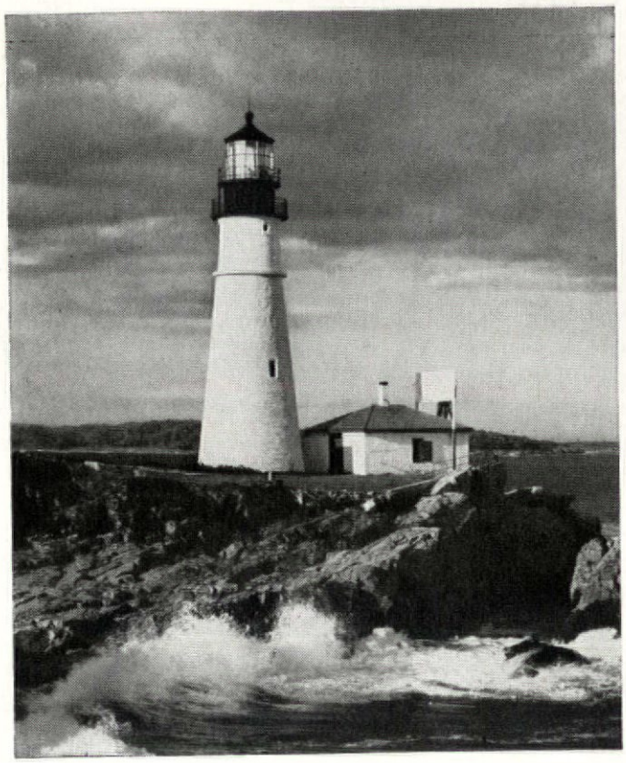
(Continued on page 43)

Richards



PRIZE WINNING HOUSE in design contest is built in Tacoma

FIRST OF SEVERAL models of Bruce Walker's top prize winning home in the design contest sponsored last year by **THE MAGAZINE OF BUILDING** and the National Association of Home Builders was built at Tacoma, Wash. The Tacoma Master Builders Association, erecting the house for a home show, located it on a corner lot, although Walker design called for an interior lot, then cut a window in carport wall (left) because this faced the street. To provide view of the Tacoma Narrows bridge, association also reversed floor plan. The house drew 2,500 sightseers. Builders in eight other cities also have Walker house under construction, says NAHB.





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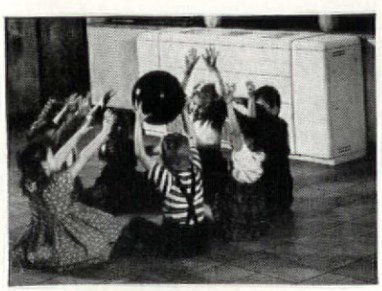
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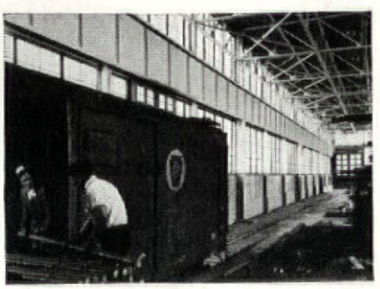
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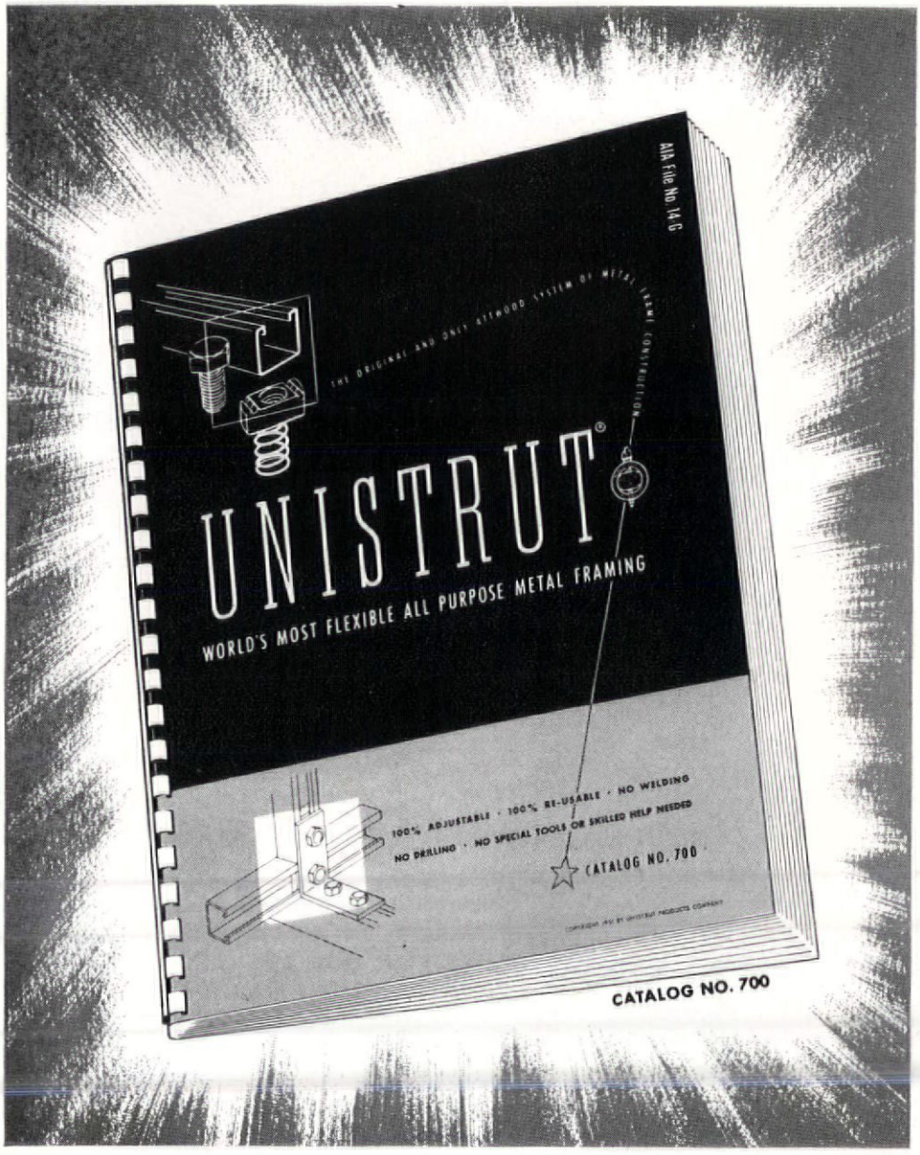


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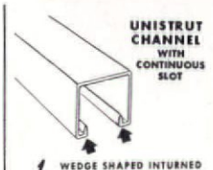
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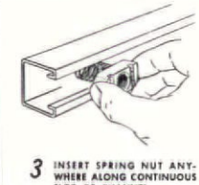
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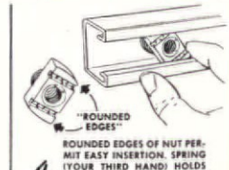


1 WEDGE SHAPED INTURNED EDGES TO TAKE SERRATED GROOVES OF UNISTRUT NUT.

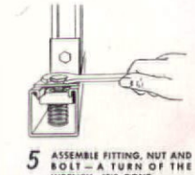


2 SERRATED GROOVES "BITE INTO" INTURNED EDGES OF CHANNEL FOR POSITIVE CLAMPING ACTION.


3 INSERT SPRING NUT ANYWHERE ALONG CONTINUOUS SLOT OF CHANNEL . . .

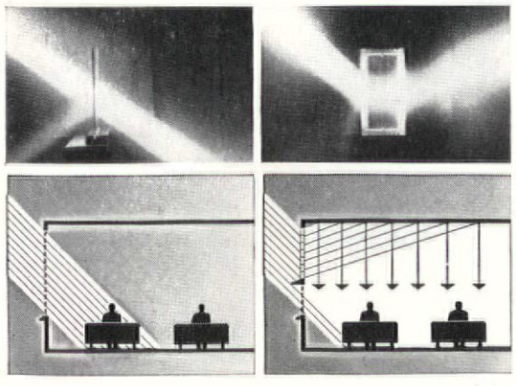


4 ROUNDED EDGES OF NUT PERMIT EASY INSERTION. SPRING (YOUR THIRD HAND) HOLDS NUT SNUGLY IN PLACE FOR BOLTING.


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tion got about as much as it did last year (roughly 13%, plus another 4¼% for building materials). But the oil industry hogged 7% of the construction industry's share. That left the pickings slim for everybody else.

To add to the confusion, DPA deliberately allotted 15% more steel (2.7 million tons) than the probable supply. During World War II, the War Production Board discovered that many a manufacturer who was allowed to buy steel failed to place orders or had to cancel them because he was behind schedule, or because other components would not be assembled in time. That gap is "slippage." When CMP began in the third quarter, DPA expected a high rate of slippage in the confusion of the new system, allotted 130% of steel.

Almost everybody was unhappy with what they got for the fourth quarter. Producers of civilian goods, only three weeks after Fleischmann assured them they would be cut back no further this year, were slashed again—autos from 65% to 60% of production during the first half of 1950, other civilian hard goods from 70% to 65%. James Fairman, Administrator of DEPA, whose allotment was cut back from the third quarter to the fourth, hoped to get a revision made from DPA's 5% reserve. He argued that the enlarged industrial plant which the defense program envisions for 1954 can't operate without power, and to supply that extra power in '54, DEPA must have steel to build power plants now.

'Too few homes.' Home builders cried again that mobilizers were making a mistake in limiting new home construction to 850,000 units for 1952. The difference, said the NAHB, between building 850,000 and 1,000,000 houses is just *.3% of the nation's steel, 1% of its copper and .2% of its aluminum.* This time, the association was able to back up its pleading with an impressive 30-page packet of statistics prepared by NAHB Materials Expediter Leonard G. Haeger. He found that the average new home uses 2.44 tons of steel and iron, 299 lbs. of copper, 47 lbs. of aluminum.



TACOMA BANK finds the way around NPA building ban

When Puget Sound National Bank decided last winter to build a new branch in Tacoma's growing K Street district, NPA refused approval. Meanwhile, rival central Bank of Tacoma, learning of the branch building project, leased an old building on K Street, readied a competing branch. Nettled Puget Sound Bank scrounged materials, flung together this Quonset-type hut branch in ten days. Bank officials say no NPA rules were violated.

Thus, wrote Haeger, "while the home building industry will account for nearly 33% of the dollar volume of the entire construction industry in 1951, new residential construction will require only 13% of all the steel, 26% of all the copper and 8% of all the aluminum used by the construction industry." Other housing requirements: 5% of reinforcing bars, 38% of nails, 51% of cast iron soil pipe, 2% of the cement used in all construction.

Crystal ball. The steel drought would be temporary. Output was rising faster than officials expected. Aluminum production mounted steadily. But the dearth of copper would be industry's No. 1 materials problem next year. Supplies this year will be lower than last. Some mobilization officials think it will mean a much more severe cut-back on auto production plus severe use restrictions on copper wire for electrical installations.

Uproar Over Public Housing: Builders, Bankers Attack 'Dishonesty' of Officials

The 42,000 public housing "starts" in June and the mid-July flotation of $171 million of public housing bonds poured gasoline over the flaming public vs. private housing fight. Private industry unloosed its shrillest vituperation. Strongest language of all came from President Milton T. MacDonald of the Mortgage Bankers Association. Cried he: "For the first six months of 1951, while private housing starts decreased over 27% compared with a year ago, public housing starts increased 65%. . . . The transparent dishonesty of public officials in substantially reducing private construction . . . and then permitting the start of thousands of public housing units in excess of any former building ought to be thoroughly exposed."

Executive Vice President Herb Nelson of NAREB complained: "The (bond issue) shows clearly that in Washington, where all pay lip service to anti-inflationary measures, government bureaus and our citizens are not subject to the same code of ethics . . . Nothing could show more clearly the hypocrisy of the spenders who seek to destroy the republic in order to create a socialized state."

Executive VP Frank Cortright of NAHB seized the occasion to urge Congress to halt public housing completely for the emergency. In his letter to members he branded the public Housing Administration's 42,000 starts as a "phony figure . . . a trick to get under the wire with technical starts" to circumvent legislators bent on cutting the program.

The influential *Wall Street Journal* complained that the public housing program shows that while the government had used tighter mortgage controls & building materials allocation to restrict private building, it "hadn't done anything to check the most fertile source of inflation in the building industry, government building." Snapped the Journal: "the government's anti-inflation program in the building industry is 'criss-crossed' . . . it strikes us that there's a surplus of heads."

Most public housers remained discreetly silent, hoping the storm would blow over. But Executive Vice President Lee F. Johnson of the pro-public housing National Housing Conference exhorted his members to keep reminding Congress "that anything less than 50,000 low-rent housing dwellings for the coming year would spell disaster. . . ."

Bumper crop. Many of June's public housing "starts" indeed did *not* represent bona-fide beginnings of construction. Time-honored practice of the Bureau of Labor Statistics is to count Public Housing Administration's "proceed orders" as actual starts. Bulk of public housing starts were "proceed orders" June 28, 29 and 30, which meant most ground breaking in July. For private housing, BLS counts only genuine starts.

1951

	Private	*Public*	*Total*
January	82,200	3,700	85,900
February	76,500	4,100	80,600
March	90,100	3,700	93,800
April	84,500	3,500	88,000
May	93,800	3,200	97,000
June	87,700	42,300	130,000
Total	514,800	60,500	575,300

1950

	Private	*Public*	*Total*
January	77,800	900	78,700
February	82,300	600	82,800
March	116,000	1,300	117,300
April	131,300	2,100	133,400
May	145,700	3,400	149,100
June	143,400	900	144,300
Total	696,500	9,200	705,700

But what most concerned private housers was the long-range threat to private building and financing they saw in the $171 million bond issue. (Involved were tax-free, Treasury guaranteed issues for 58 local housing authorities in 20 states and Hawaii.) And the $171 million was only a starter. PHA was planning another issue of $200 million later this year and a jumbo-sized $555 million issue early in 1952. Ultimately, it would help local authorities unload $8 billion worth of bonds to finance

(Continued on page 47)

Even Conservative New England Goes for *National* Homes

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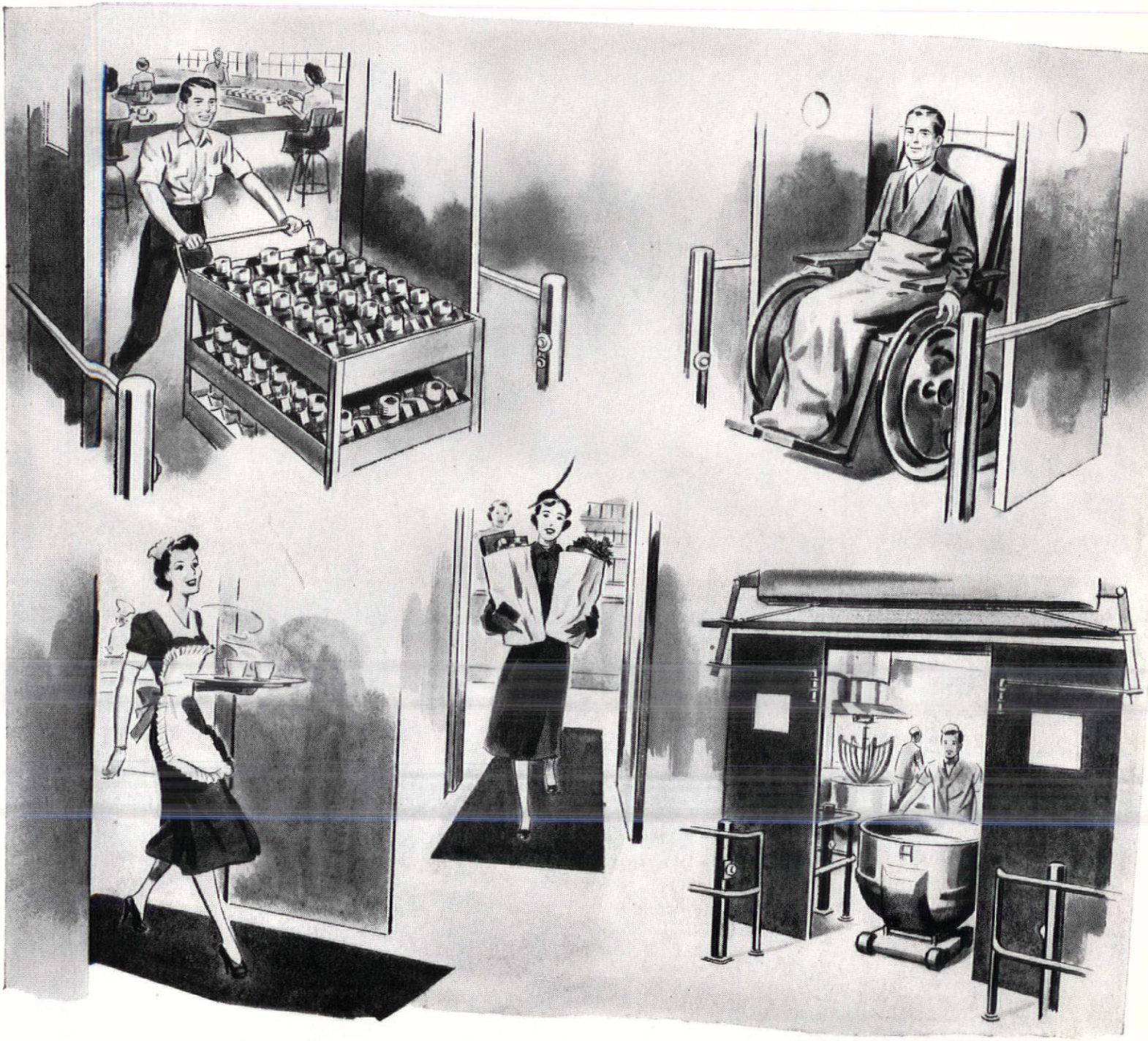


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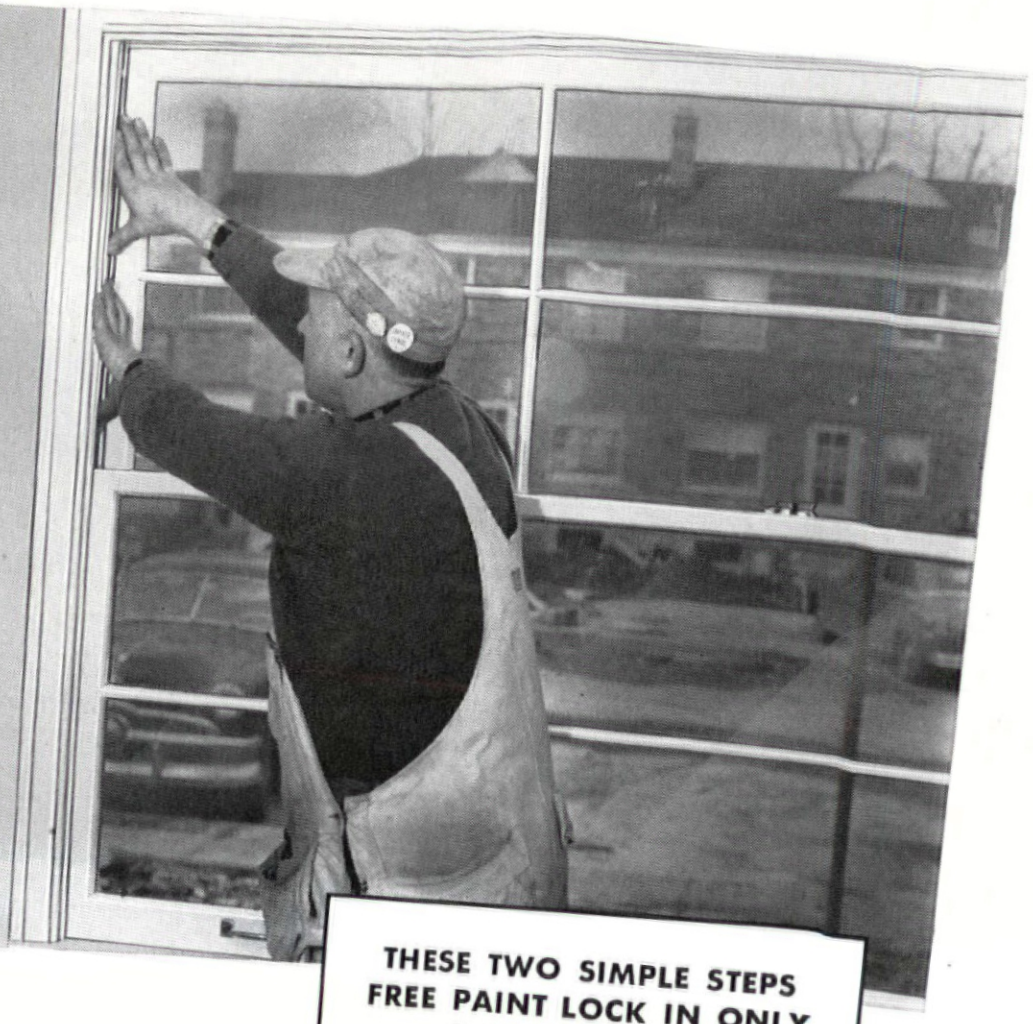
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2. Force lower sash to the left and repeat the process for the upper sash. Paint lock is broken in a neat, straight line.

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- ☐ Carpenter-Contractor

the 810,000 housing unit program set up by the Housing Act of 1949. Private housers insisted a program so big is inconsistent with other national policies. Reasons:

▸ The Treasury has been trying to reduce the volume of tax-free bonds. Tax exemption has been denied to Federal bonds. But $8 billion of public housing bonds would swell the total of tax-free issues in the U. S. economy by a whopping 33%.

▸ The government had unpegged its own bonds, so interest rates went up. But interest on VA and FHA mortgage loans (supposedly aids to private enterprise) remained frozen by administrative fiat, so the market for both was in the doldrums. Yet to promote its more socialistic public housing program, the same group of administrators (under HHFA Chief Ray Foley) agreed to pay what the market demands. This turned out to be an average of 2.073%—equivalent to about 4¼%* on a bond without tax exemption because the average investor in tax-free securities is rich enough to be in the 50% and up income tax brackets.

▸ The bonds were thoroughly inflationary: The tax-exemption would siphon off potential tax revenue. The Treasury would be compelled to add to its deficit to the extent it must increase subsidies to housing authorities to meet interest and principal payments.

Screwball economics. The 2.07% interest took PHA by surprise. It had expected to float the issue at about 1.75%. But after a day's hesitation, it shrugged and accepted the bids of a dealer syndicate led by Blyth & Co. and a banker group headed by Chemical Bank & Trust Co. of New York (who offered an extra ⅓ to ½% commission to put over resales). The higher interest rate meant more taxpayer subsidy, not higher rents on projects.

A few cool heads in the PHA argued privately that it made no sense to persist with a big program amid the scarcities and high costs of semi-mobilization. They were outshouted. Asked why public housing bonds were floated at such a time, Assistant HHFAdministrator Neal Hardy replied it was "more or less inevitable" because the issue had been planned for months. At month's end, however, it appeared public housers may have outsmarted themselves. When Congress saw the upsurge in starts, heard the yells over the bond issue, sentiment hardened for imposing a squeeze. Result was the House balked at accepting Senate action pegging starts for this fiscal year at 50,000, sent the Independent Offices Bill carrying the limitation back to conference, with instructions to House conferees to insist on the House's 5,000 ceiling.

Rally 'round the flag. Counting June's deluge of starts, PHA had some 92,000 units under construction. At over $10,000 per unit, total cost will exceed $1 billion, which means a sizeable public housing program will go up this fiscal year, no matter what Congress does. More significantly, public housing had jockeyed itself into a brilliant spot to convert its program to defense housing as a "temporary expedient" late this fall or early in 1952, when other plans for producing defense housing have fully flopped. Already, defense mobilizers were planning to use 500 public housing units nearing completion at Moultrie, Ga., to fill part of that possible critical area's housing need.

If public housing is converted to defense housing, public housers would have a good argument later for seeking more funds for projects for the people who were supposed to get it in the first place.

* Compared to net yield (after costs of collection) of 2.75% on non tax-free Government bonds, 3.5% on VA mortgages, and 3.6 to 3.75% on FHA-insured mortgages!

PREFAB PUBLIC HOUSING: Gunnison wins first contract of its kind

Prefabs broke into the realm of federal public housing for the first time last month. U. S. Steel's prefabricated housing subsidiary, Gunnison Homes, Inc., won the nod for 91 units (81 one-story duplexes, 10 one-story 4-family row homes) in an otherwise conventional project totaling 128 buildings at its hometown, New Albany, Ind.

Director William E. Bergeron of the Chicago Public Housing Administration office observed that the New Albany project achieved the lowest average room cost ($1,654) among 30 public housing projects a-building in the midwest. Still, he confessed disappointment that savings from prefabrication were not greater. The average Gunnison house sells for about $700 a room to dealer-contractors, who actually bid on the New Albany job. So local contractors apparently asked about $900 a room to pour the slab, hitch up the plumbing and wiring, assemble the houses. Bergeron would probe trimming their take.

DEFENSE HOUSING BILL

Much Compromised, Nears Passage

For four months, the battle in Congress over defense housing policies had been stalemated. Ever since the Senate passed its version of a Defense Housing Act in March, neither the powerful Republican-southern Democrat coalition nor pro-Administration forces in the House had been able to muster enough votes to enforce their views. Both sides were stubborn. The Republican-southern Democrat coalition refused to have any truck with government-built housing proposed as a last resort in critical areas. Administration legislators refused to vote separately on any other housing measures, thus holding hostage non-controversial items like upping FHA's Title II insuring authority, a new lease on life for the expired Wherry Act.

Pressures against the log jam built up steadily. Even though home building had slowed because of the mortgage pinch, FHA was unable to keep up with the volume of applications it was receiving. Veterans were squawking about being denied the benefits of the GI home loan program. Finally, Sen. Lyndon Johnson's Defense Investigating Committee captured the nation's front pages with a pointed blast at chicken coop housing which was all servicemen's families could find around reactivated military bases. The Committee laid the ostensible blame on the armed services and irresponsible landlords. But between the lines lay an adroit slap at the House for dragging its feet on the bill that would ease the soldier's plight. Fumed one Congressman:

"Congress is putting itself in the ridiculous position of refusing to provide funds for government housing around new installations of the armed services and at the same time denying private enterprise an effective tool to tackle the job."

Action at last. At the first of this month, the jam finally broke. The House Banking Committee agreed on a compromise bill which builders thought a good deal better than the Senate version. The House bill would:

1. Give private builders first crack at defense housing by setting up a definite order of precedence: relax Regulation X, invoke the new Title IX of FHA, after 60 days let HHFA step in with public housing.

2. Take most of the sting out of the Senate certification amendment designed to keep builders from borrowing more than their costs. For 1 to 4 family housing (expected to be the predominating type) it was eliminated entirely. For multi-family housing, builders would have to certify that mortgages did not exceed costs, but unlike the Senate bill, the House bill would let them include profits in computing costs.

3. Provide $75 million for government-built housing where private industry can't do the job. (Senate approved $50 million.)

4. Authorize $100 million Federal loans and grants for community facilities. (Senate voted $60

(Continued on page 49)



Outstanding floor beauty can be achieved at low cost with Armstrong's Asphalt Tile. Its distinctive non-directional swirl graining offers many decorative advantages. It also helps save time in installation. Alkali-resistant pigments assure that its beauty will be unaffected by the moisture in basement and grade-level slabs.

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Lackland Air Force Base, San Antonio, Texas
Designed by Cerf Ross Associates

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million.)

5. Rescue regular Title II FHA, by giving it $1.5 billion increased insurance authority without strings on where it will be used. (Senate restricted benefits of this shot in the arm to critical defense areas.)

6. Ease Regulation X for veterans, who would be permitted to buy homes up to $12,000 with 6% down payments. This was shifted from the Defense Production Act, and broadened to include not only critical defense areas, but everywhere else in the country. A companion proposal to let anyone buy a $10,000 house with only 10% down was killed in committee, but would probably be resubmitted on the House floor.

Advance takeouts. Another floor amendment being readied by Rep. Clinton McKinnon (D., Calif.) would set aside $500 million for FNMA to give advance mortgage commitments in critical areas. This time, it looked as though the Defense Housing Bill would really pass. Both Republicans and Democrats were fed up with the issue. There would be some fighting on the House floor by bitter-enders, but the timetable of House leaders called for a final vote by mid-August. Conceivably, the housing bill (after more House-Senate conferences) could become law by Sept. 1. Builders hoped FHA Title II would last.

Levitt to Build at Morrisville, Pa.; Biggest Defense Town Rising Without U.S. Aid

It was a safe bet that U. S. Steel's $400 million plant now 12% completed at Morrisville, Pa., would transform Bucks County from a rural haven into the biggest new industrial center in the East. Highly probable was ultimate creation of a new Pennsylvania city second only to Philadelphia and Pittsburgh in size. Though the Fairless steel works itself would employ only 5,000, at least half a dozen manufacturers (among them firms like Philco, Carborundum, & Kaiser Metal Products, Inc.) already were reported planning to expand or erect plants nearby to take advantage of cheaper steel. By one conservative estimate, their labor force plus the accompanying influx of butchers, bakers and grocers would mean at least 26,000 new workers (plus families) in the area within a few years.

Few were surprised therefore when Builder William J. Levitt picked up options to buy 2,000 acres of rolling, wooded Bucks County farmland beside the Bristol Turnpike, announced plans to build an "integrated city" for anywhere from 50,000 to 90,000 people. Plans called for 10,000 to 17,000 homes, a shopping center and community facilities "much more completely planned than anything we've ever done before." Road grading and utilities installation were to begin by September, home building by next spring. This month, Levitt's staff was designing a new model house for Morrisville to sell around $10,000, was mulling over ideas for "executive models" priced from $16,000 to $22,000. Altogether, if Levitt builds the 10,000 homes he hopes to in two years, he will have a $100 million town.

Prefab competition. Levitt's projected community already had a rival. Realtor John W. Galbreath of Columbus, Ohio, affable good-looking ex-president of NAREB who has been remodeling and building towns for U. S. Steel for several years, got started on a new community about a mile from Levitt's site last June. By the end of July, 138 Gunnison prefabs had sprouted along the curving streets hugging the gentle contours of one corner of the 1,500 acre Galbreath tract. Daily, 12 more were rising.

Red-tapeless wonders. The Morrisville area was probably the only zone in the country facing such an in-migration which had not yet been declared a "critical area" by the Government. Chief reason, said Washington insiders, was Labor Department insistence that there was a pool of surplus labor in Philadelphia, 30 traffic cluttered miles south, and in Trenton, N. J., five miles northeast. The Labor Department reported 73,000 unemployed in the eight county Philadelphia metropolitan area, (population 4,000,000). Snorts Bill Levitt: "Many of these are unemployables. During the peak of World War II Philadelphia had 60,000 unemployed, with less population."

If Morrisville area were listed as "critical," Levitt and Galbreath could sell their homes at lower down payments since Regulation X would then be relaxed. But firms who want to build satellite plants fear that if Morrisville gains the critical tag, their construction plans will be nixed by bureaucrats. Prevailing official thinking is not to permit many additional defense plants in critical areas. Moreover, in other critical areas across the U. S., HHFA has enmeshed its half-way relaxation of Reg. X (itself a lame aid) with a rule that no builder may be allocated more than 50 units. This would rule out big scale operators like Levitt and Galbreath who so far constitute private enterprise's only visible hope of producing well-knit defense towns. Besides, Messrs. Levitt & Galbreath had moved ahead without Government aid. In specially aided "critical areas" very little housing was being built (*see below*).

CRITICAL AREAS: HHFA program complete failure in San Diego

Proof positive that the defense housing program was a scandalous flop emerged from California. In bustling San Diego, biggest defense area yet designated, HHFA's 60-day time limit on the starting of construction expired for builders (who oversubscribed the defense housing quota of 6,000 houses). Exactly one builder had a house under construction: Whico Construction Co. was erecting an $8,500, 2-bedroom house for Earl R. Severin, who held certificates for five others. Builders blamed their failure on lack of mortgage money and unrealistically low ceilings set by HHFA on purchase prices and rentals (THE MAGAZINE OF BUILDING, July '51, p. 36).

(Continued on page 55)

HOW NEW CONTROLS ACT AFFECTS BUILDING

In renewing the Defense Production Act for another 11 months, Congress did not change much for the building industry. But the Act remained the most important single piece of legislation for businessmen operating under mobilization. Chief features:

Requisition Authority. For real estate, only by eminent domain, with a substantial payment before U. S. takes possession. This gives unwilling sellers greater protection than the original Act.

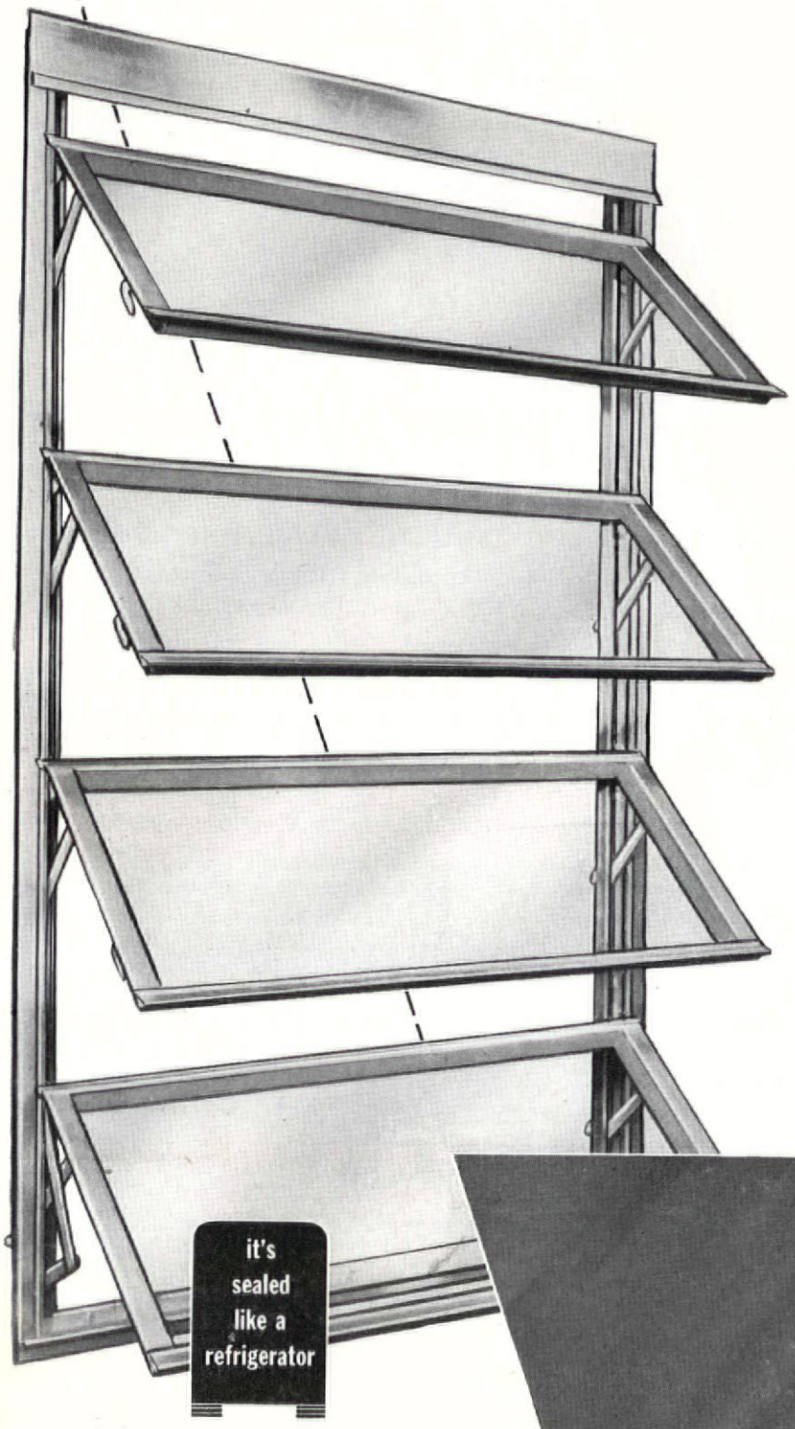
Plant Expansion. Continues the President's powers to guarantee or make loans. Does not empower new plant construction by Government, as Truman asked.

Wages. Leaves present powers virtually unchanged.

Credit. Keeps housing credit restrictions (Regulation X) except in critical areas. Congress refused to add power to control existing housing. Proposed limits on housing credit were dropped after Congressmen agreed to include them in Defense Housing Bill.

Rent. Shifts Tighe Woods' Office of Housing Expediter to the President, (who gave it to Economic Stabilizer Eric Johnson). Allows residential rent increases of 20% over June 1947 levels (rents have already risen about 17½ since then). Allows rent rollbacks to pre-Korea levels where state or local authorities ask for it because war work makes housing short. Permits Mobilization Director AND Secretary of Defense to recontrol areas around war plants or bases where housing shortage threatens rent gouging of immigrants. In such areas, requires Regulation X relaxation adequate "to encourage construction of housing." Bars Defense & Mobilizer from recontrolling in any state with local rent control unless BLS rent index has outrisen national average for six months. Denies power the President sought to control commercial rents.

Concerning a Matter

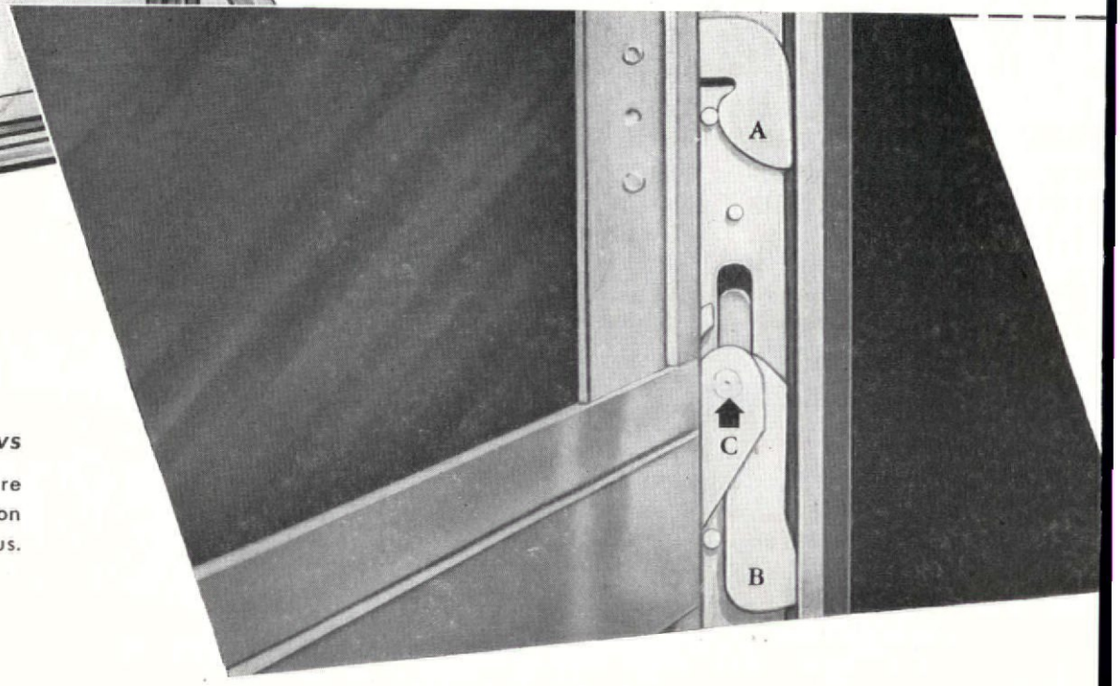


it's sealed like a refrigerator

To specify the type of material or equipment, best qualified to do the job, is not just a mere hope on the part of the architect. It is a matter of principle on which he stands firm.

With awning windows there is a matter of principle involved, too -- more particularly a matter of operating principle...Until the advent of the AUTO-LOK window, all awning windows functioned along identical lines, generally identified as the three-suspension point principle. They look very much alike, but in the minds of many architects they fell down in many respects; one of the most important being . . . ***too much air infiltration.***

Too much air infiltration, even when they were new...and then because of the tremendous force required to close a window with the three-suspension point principle, this destructive force on the critical suspension points soon makes it impossible to close these windows with any degree of tightness.



The "HEART" of AUTO-LOK Windows

. . . the patented hardware which has made the nation awning window conscious.

of OPERATING Principle

Auto-Lok IS THE TIGHTEST CLOSING WINDOW EVER MADE

Ludman engineers devoted many years to the development of an awning window that provided a degree of tight closure heretofore believed impossible, **in any window type.** And, further, this unrivaled tight closure can be counted on for the life of the building.

Thanks to the Auto-Lok principle, embodied in patented Auto-Lok hardware -- such windows are available for your specification today. The secret to Auto-Lok's versatility (they are installed in all types of building, in all climes) lies in its amazing tight closure, combined with the "natural" advantages of its awning type design. Auto-Lok hardware ingeniously pulls the vents **anchor-tight** and automatically locks them, against the vinyl plastic weatherstripping, sealing these windows just like a refrigerator. You are assured of a tight closure, TEN TIMES AS TIGHT as the generally established standards for casement windows and projected sash.

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The Auto-Lok aluminum window is the fastest selling awning window in America; its companion window, recently introduced -- the Auto-Lok Wood Window, incorporates every proven feature of the aluminum window, plus the virtues inherent in the properly selected, seasoned and chemically treated wood.

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Shown is the exclusive Auto-Lok locking device which engages the operating bar. This action is entirely automatic and is accomplished during the normal opening and closing of the sash. Strain has been eliminated, for it is not necessary to build up excessive pressures on pivotal points in order to close vents tight against the frame. Note how the keeper (A) attached to the vent locks bottom of vent, and how "hinge dog" (B) gives similar locking action at the top of each vent. Note how pivotal point (C) is entirely free and not subject to any pressures which cause wear.

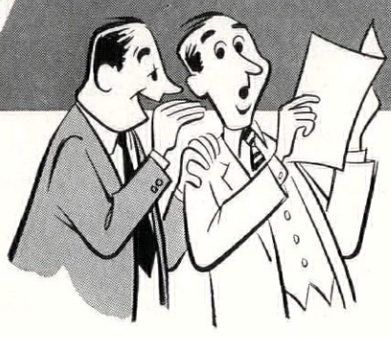
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3 Barrett speeds application. Barrett does not have to rely on outside sources of supply for roofing pitch and felt. Because Barrett Specification* pitch and felt are made in our own factories, production can be controlled to meet demands. Your roofer can be sure that he will get the materials he wants when he needs them. No time lost on the job! Moreover, he can be sure that these materials will be of uniform high quality.



4 Barrett speeds you the finest possible roof. Expert roofers make for fast jobs. Barrett Approved Roofers have had many years of practical experience, plus well-trained man-power, plus Barrett engineering help, to assure you the finest possible roofing job in the shortest possible time.



Barrett Specification* Roofs

But don't wait until you're up against it before ordering necessary roofing work. Call in a Barrett Approved Roofer today, or write us.

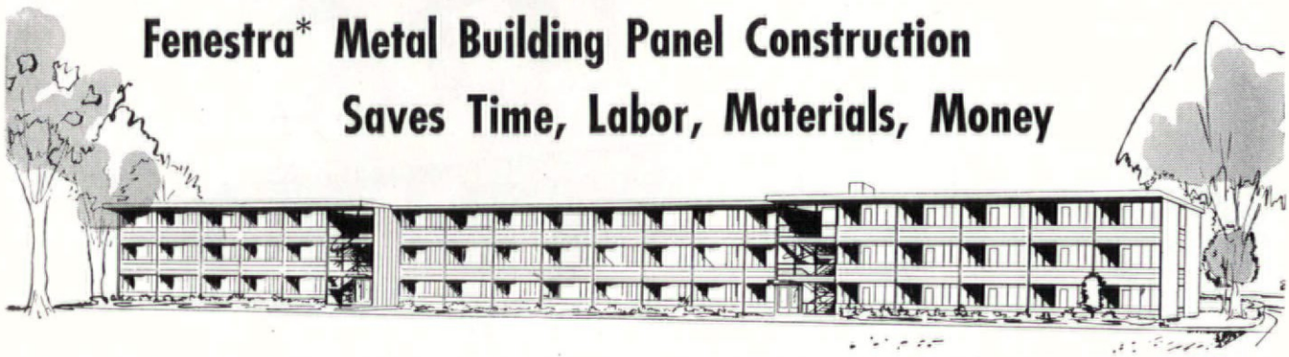
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As compared to the cost of conventional barracks construction, estimated at $2,300 per man, the cost of the nonconventional barracks illustrated above is only an estimated $1,485 per man (just $1.11 per cubic foot)!

And this barracks at Offutt Air Force Base, Omaha, Nebraska, is something special. Flyers of the Strategic Air Command fly "around the clock." As some sleep, others are "taking off." So army engineers are giving them 2-man rooms for peaceful quiet and privacy, better and more convenient bath facilities, a pleasanter place in every way—all at $1.11 per cubic foot . . . a saving of one-third. How?

First, they erect a steel frame. Then into the frame go Fenestra "C" Panels to form curtain walls. These strong, lightweight steel sandwiches packed with glass fiber insulation are 16 inches by 14 feet and can be placed by two men. They form a finished, prime-painted, noncombustible outside and inside wall at the same time. After three courses of "C" Panels, in goes a 14-foot window assembly including Fenestra Steel Windows. Then more panels and up leaps the building!

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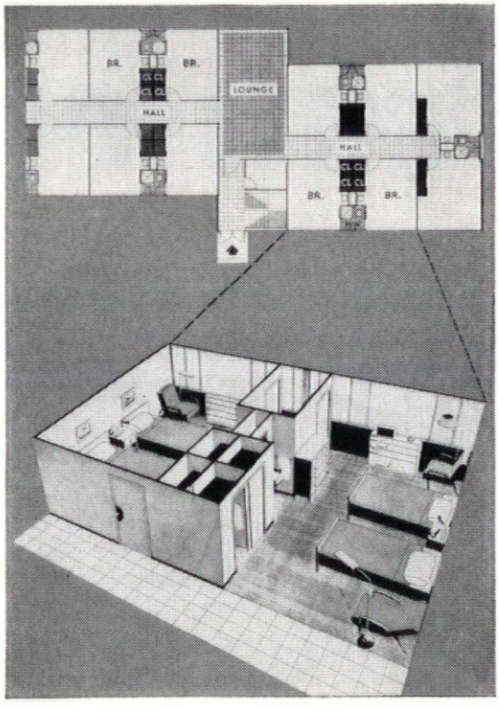
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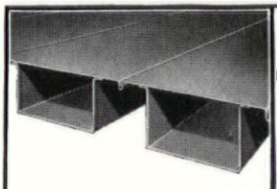
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Only $1.11 Per Cubic Foot for this 37 x 282-ft., 3-story Offutt Air Force Base barracks housing 216 men. Total cost about 321 thousand dollars—approximately 30% less than conventionally built barracks . . . and the whole building is firesafe! Contractor: Korshoj Construction Company, Blair, Nebraska.

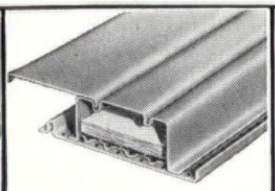


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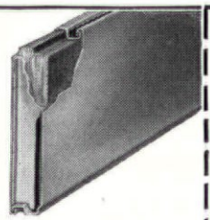
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HHFA cancelled builders' allocations for more than 3,000 of the 6,000 home quota. It granted 30-day extensions for another 2,000 to four builders who held out hope they may yet be able to break ground. This month, HHFA was still wondering what to do about the remaining 1,000.

No confidence. San Diego builders' inability to find mortgage money reflected more than the general pinch on funds. A month ago, HHFAdministrator Ray Foley ordered Federal National Mortgage Association (Fanny May) to put aside its ordinary rule of buying mortgages only after they are 60 days old. By buying mortgages from critical areas as soon as they are written, FNMA might help stimulate the flow of private mortgage money, thought Foley. But lenders remained reluctant. One reason: they didn't trust the fact that Foley had so much personal power he could change the Fanny May rules any time he liked. Yet Fanny May was the only important market for VA loans. Commented a top U. S. mortgage banker: "The secondary market is not taking Foley's say-so at face value. I see no disposition on the part of long-term lenders to change their sights one iota because of Foley's new rule. He never consults anybody but the bright young men in his own office before he makes these decisions."

In the Idaho Falls critical area, Builder David M. Sweeney found himself unable to finance a projected 100-home tract, turned to general contracting! He observed: "We're so out of touch with HHFA here we have no way of knowing Fanny May's $350 million (earmarked for critical areas) won't be exhausted by the time projects begun now are completed."

The obvious remedy was advance takeouts. Congress would consider this (p. 49).

More areas. Despite the hopelessness of actually getting much construction underway under the present rules, DPA barged ahead, named 19 more critical areas. These were:

Area	*Units for: Rental*	*Sale*	*Total*
Huntsville, Ala.	400	200	600
Borger, Tex.	200	none	200
El Centro-Imperial, Calif.	40	60	100
Dana, Ind.	40	40	80
Mineral Wells, Tex.	100	none	100
Las Cruces, N.M.	100	100	200
Alamogordo, N.M.	70	65	135
Columbus, Ind.	210	140	350
Wichita, Kan.	1,500	500	2,000
Lone Star Steel Co. area, Tex.	100	none	100
Camp Lejeune area, N.C.	none	300	300
Killeen-Fort Hood area, Tex.	800	200	1,000
Dover, Del.	150	50	200
Patuxent, Md.	75	25	100
Total to date 35 areas	14,050	7,460	21,510

Named critical areas by DPA, but housing quotas not yet set by HHFA: Norfolk-Portsmouth, Va.; Lancaster-Palmdale-Mojave, Calif.; Othello, Wash.; Wright-Patterson Air Force Base at Dayton, Ohio; Sampson Air Force Base, N. Y.

Shakeup. In the works was a scheme to revamp the administrative machinery DPA uses to decide which areas of the U. S. will be designated "critical." Hatched by Arthur S. Flemming, top defense manpower official, it would put more emphasis on 13 regional defense mobilization committees, tend to eclipse the inter-agency critical areas committee led by youthful, dynamic Ralph Kaul. Flemming would have a new regional coordinating committee in Washington (probably to be headed by Eugene F. Bertrand) act on recommendations using manpower supply as a principal yardstick. Skeptical Congressmen, however, grumbled that this looked more like a bureaucratic power grab than a way to make defense housing get built in the right places. And defense housing was still a drop in the bucket of total U. S. housing production.



MORTGAGE CRISIS: builder needles lenders spurning 4%

Builder Albert Balch, who also owns Seattle's First Mortgage Co., ran this display ad in the Sunday real estate sections of two Seattle papers last month. The purpose, said he, "was not to sell mortgages. It was to put a number of national institutions (who won't buy VA loans because the 4% interest leaves them cold) on the spot." As Balch foresaw, the ad touched off a flood of inquiries from people with $1,000 to $5,000 to invest, but netted only a few from men rich enough to buy whole mortgages at $7,000 to $12,000. At the moment, whole mortgages was all First Mortgage could offer. But Balch said the firm hoped to form an investment trust to pool funds despite the stiff hurdles of State regulation involved. In Washington, top VA loan officials wished Balch well, but doubted the 3½% yield would attract many investors: it was too close to that offered by some savings and loan associations for much more liquid investment.

SAVINGS & LOANS watch business rise, see no mortgage stew

Savings and loan associations, an oasis in the mortgage money drought, have taken a dim view of builders' complaints that they could not finance houses. By last month, two leaders of the U. S. Savings & Loan League let fly.

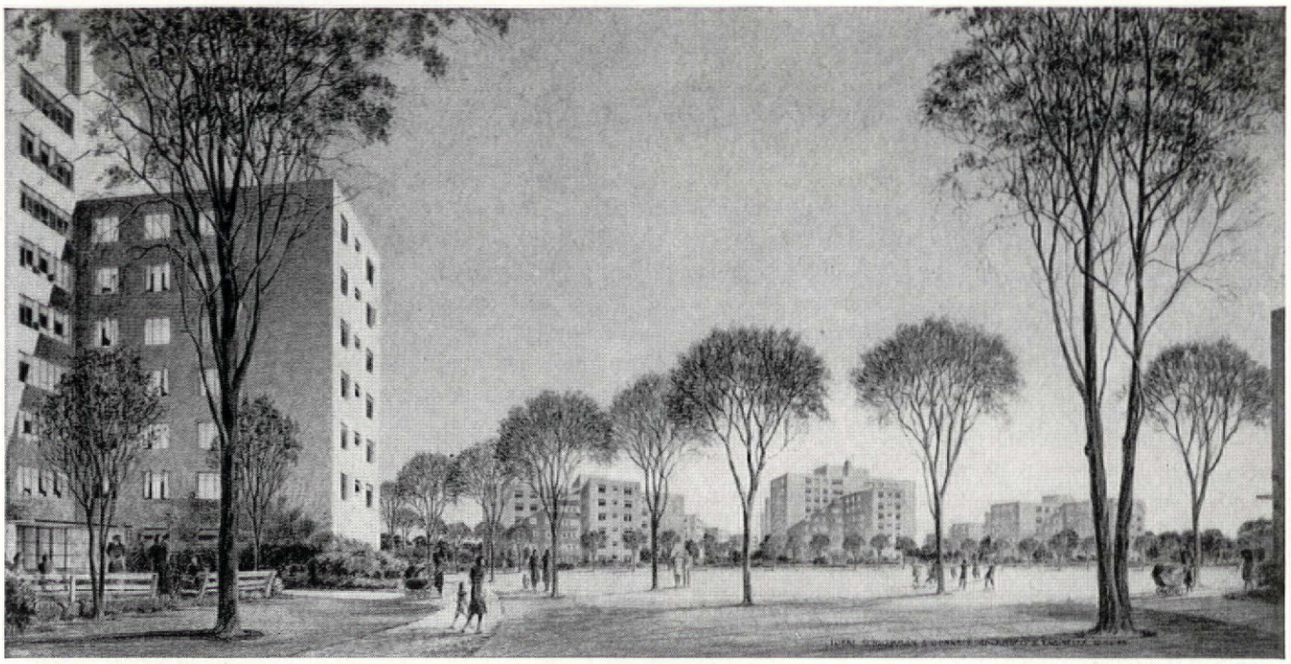
President Walter J. L. Ray branded builders' "loud cries of protest" that mortgage funds had vanished as "outright distortions of fact." He insisted: "Mortgage credit is available, consistent with the interests of the national mobilization program." Mobilization, he added, wisely called for a big cutback from last year's volume of 1,400,000 houses. "Such a volume," cried Ray, "could not have been sustained indefinitely, without serious overbuilding in many areas of the country. In short, the day of reckoning for the extreme building boom was not far off . . ."

Conventionals lead. Nobody was arguing that savings and loan associations could take up all the slack in the FHA and VA loan market. Savings and loan associations do 29% of the nation's mortgage lending. But as Chairman Morton Bodfish of the league's executive committee pointed out at THE MAGAZINE OF BUILDING'S recent Round Table on the mortgage crisis, "about 5/6 of the mortgage money in this country is loaned without government guarantees at customary rates which are not affected particularly by the government bond rate or what the FHA or GI rate is."

With rising assets (over $17 billion at mid-1951 compared with $5.6 billion in 1939) savings associations have been slowly jacking up their share of the business. Most of the mortgages they write are conventional loans. To Bodfish, that is good business. Said he: "My notion is to recognize that we are in a war situation and that war situations bring about changes . . . such as an inflation control program which I think is getting a little balance and common sense back into the construction business, including the financing, which was long overdue. You had an automatic market. Lenders more and more were not lending at their own risk. They were lending because the government had agreed to take the losses while they took the profits. You know year in and year out that isn't a sound proposition.

"Let's all get ourselves on a business basis in which the lenders are taking the risks, in which the builders are leaving more and more money in their deals, and get this whole thing out of the hands of Government. That is the wholesome way."

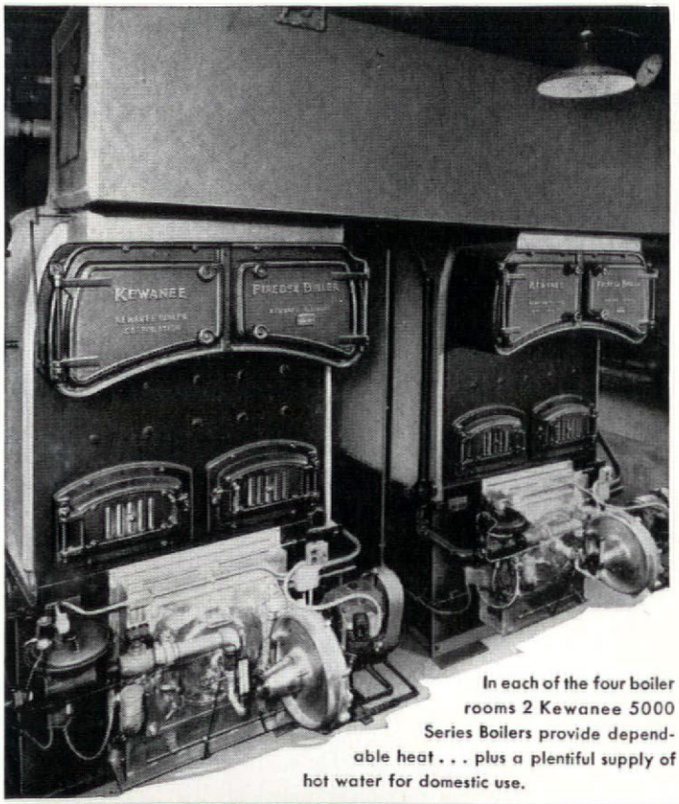
(NEWS continued on page 60)



Dearborn Homes, Chicago Housing Authority—
Loebl, Schlossman & Bennett, Architects;
Robert Gordon, Inc., Heating Contractor;
Samuel R. Lewis & Associates, Mech. Eng.

KEWANEE
STEEL BOILERS

Cut Heating Costs in Housing Projects



In each of the four boiler rooms 2 Kewanee 5000 Series Boilers provide dependable heat . . . plus a plentiful supply of hot water for domestic use.

The Dearborn Housing Development, Chicago is an excellent example of the remarkable progress being made in "homey," economical mass housing.

Built in four separate units with one, two and three bedroom apartments, the project accommodates 800 families. And, *although designed for low rentals*, the buildings include such refinements as modern heating with wall hung convectors and fin type radiators.

Each of the four units is complete in itself with its own boiler room in which *2 Oil Fired Kewanee Boilers* produce heat at the rate of 7 million Btu hourly . . . ample capacity to provide heat plus an abundance of hot water for kitchen, laundry and bath.

Because of their long standing reputation for producing heat economically, Kewanee Boilers were the logical choice for Dearborn Homes as they are for many other important housing projects throughout America.

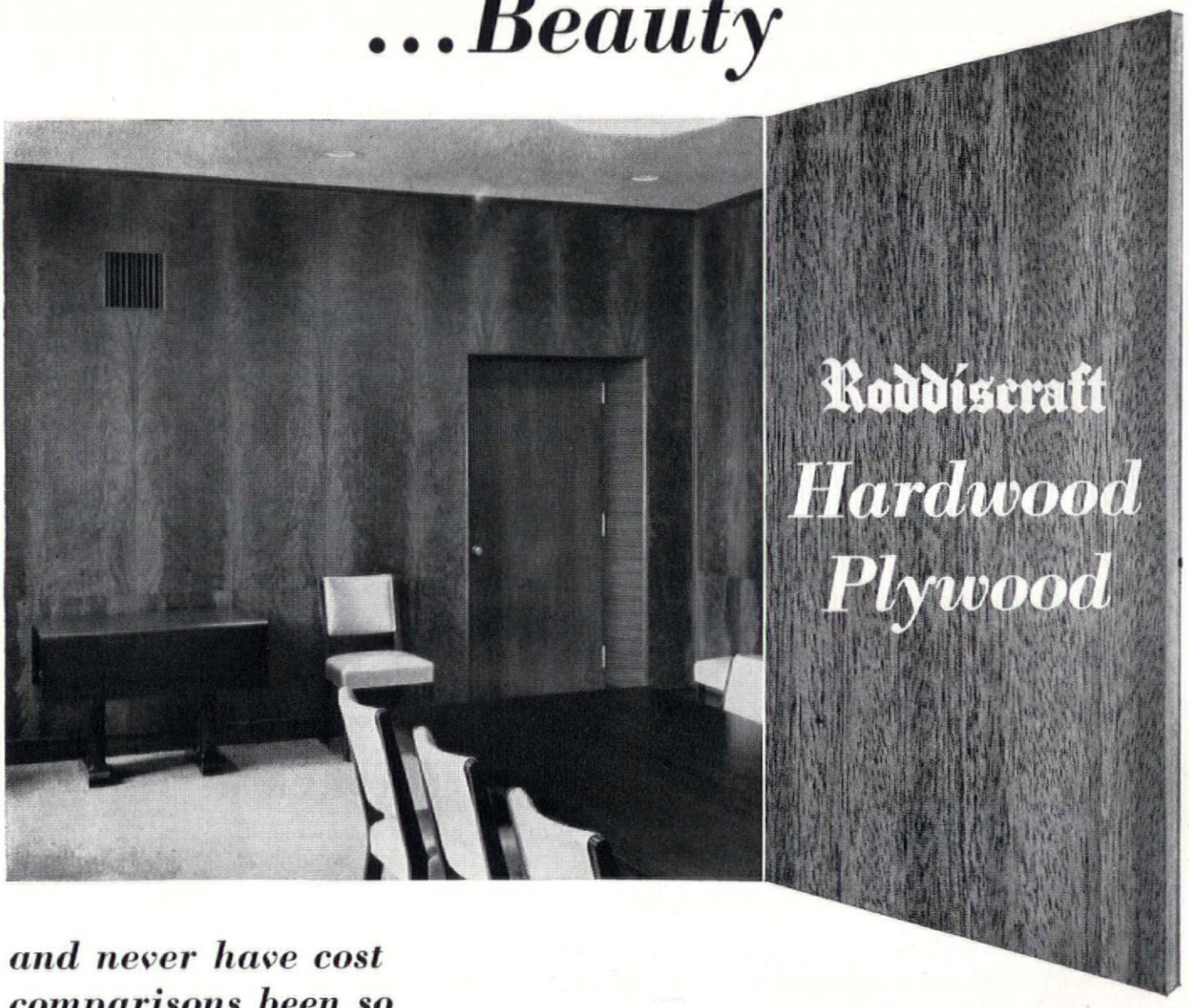
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Warmth...Texture ...Beauty



and never have cost comparisons been so favorable to this permanently beautiful wall material

Time works with you in long term low cost when the walls are Roddiscraft Hardwood Plywood. Once installed, it yields the most years of useful service and requires the least in present day costly man-hours of work to keep it always attractive.

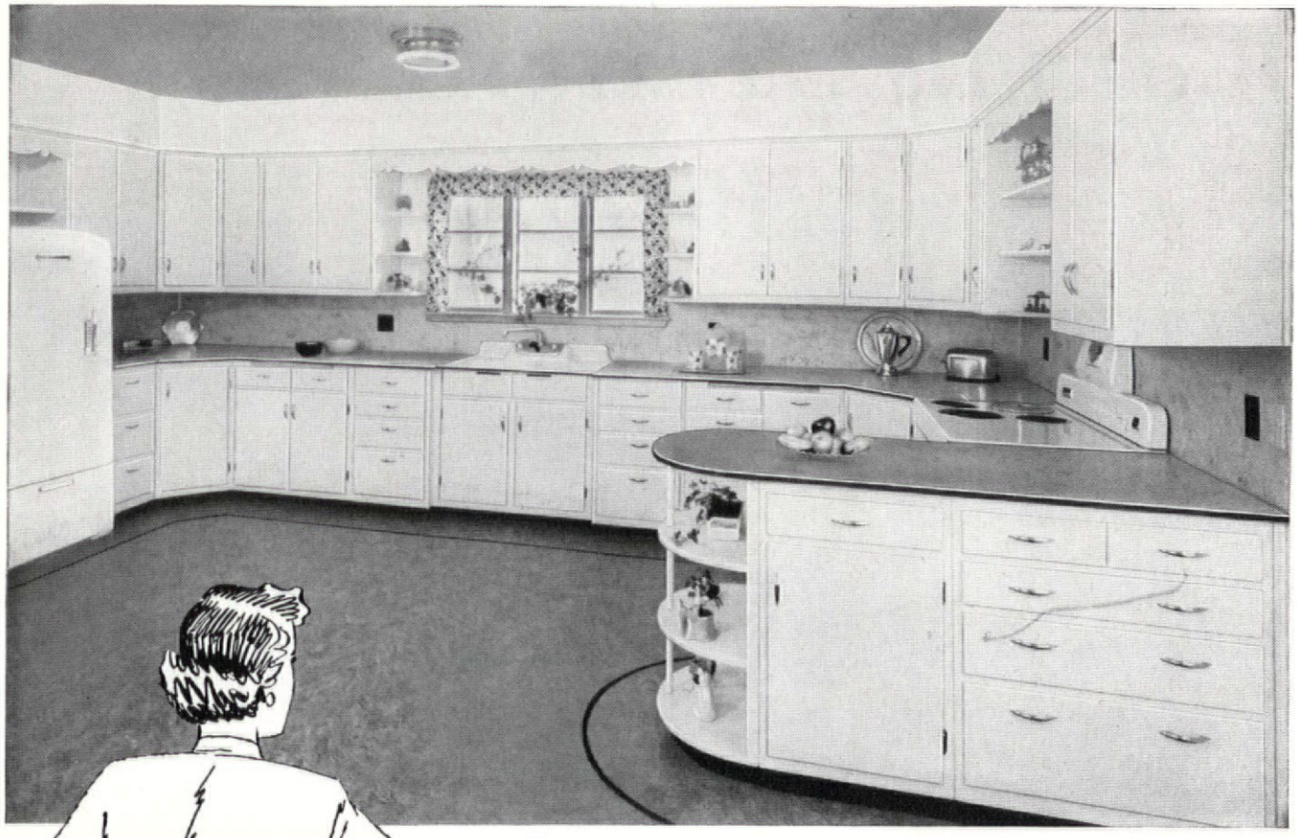
Roddiscraft Plywood is manufactured from the best veneers available — both domestic and foreign — carefully matched and fabricated by expert workmen who take pride in an established tradition of craftsmanship.

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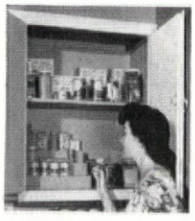


Take a

housewife's eye-view

of a CURTIS KITCHEN

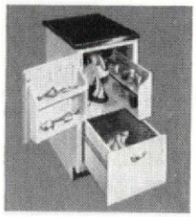
When it comes to kitchens, Mrs. America is sharp-eyed. That's why she so readily appreciates the years of experience that have gone into the design and construction of Curtis kitchen cabinets. Here are some features she'll notice in the Curtis kitchens *you* include in your plans!



Close-up of Curtis wall unit showing large storage space. Cabinet is made in 36" and 44" heights and in eleven widths—from 12" to 44". All are 14" deep.



Just the thing for quick lunches. Tabletop folds and slides into unit. Space below is pan unit for large utensils. May be used alone, or with cabinet above.



Mixer and vegetable storage unit—24½" deep, 32" high, 18" wide. Ventilated vegetable drawer is below. This unit is a "must" with busy housewives.



Pan and bread drawer unit—has two small wood drawers 3" deep and one metal bread drawer 8¼" deep, 19" long, 10¾" wide. Two widths, 28" and 32".

For long years of strenuous daily use, Curtis cabinets are made of *wood*, painted two coats at the factory. They can be left "in the white" or finished in any color of the owner's choice. All hardware is furnished and applied. For complete information, mail the coupon.

Curtis Companies Service Bureau
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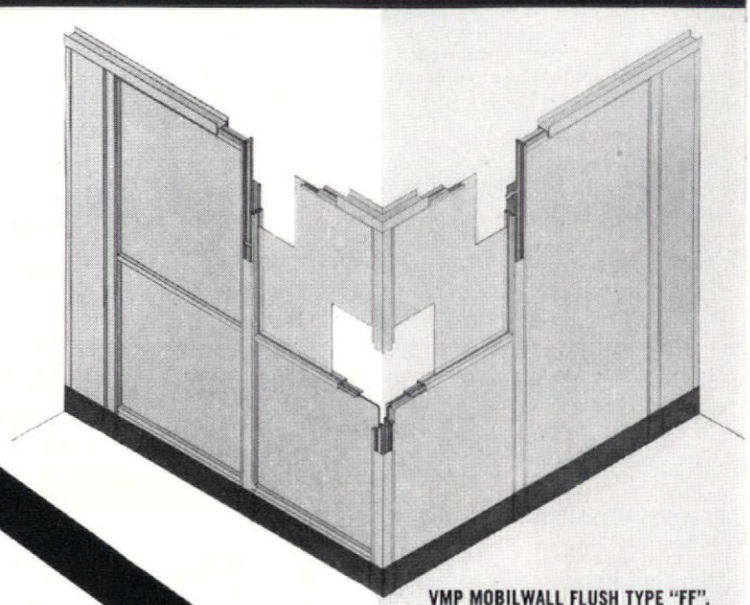
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Curtis makes a complete line of architectural woodwork for the modern home. Make your next house "all Curtis."

1866 CURTIS WOODWORK

now! revolutionary NEW VMP MOBILWALL partition development



VMP MOBILWALL FLUSH TYPE "FF".

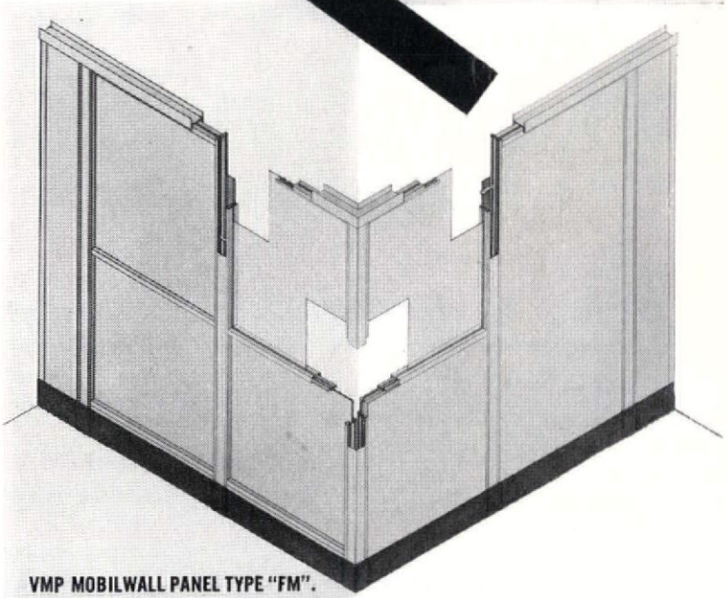
Made by combining four patented rolled shapes, for rails, one rolled universal post, one rolled post cover, a rolled cornice, a base, positive action link plates and floor fittings . . . combined with 2⅜ rock wool insulated flush panels or a glass and flush steel panels, suitable for executive and private offices.

Panel type "commercial" partitioning interlocks anywhere, anytime as desired with flush "executive" type of partitioning! Perfectly matching! Without any special adaptors!

Exclusive new interlocking design offers unmatched executive, commercial and industrial application flexibility. Your opportunity to secure substantial cost, convenience and space savings!

Interlocking units assemble in straight runs with finished ends at right angles, or in T connections, or even X connections. All panel units of the same size are completely and permanently interchangeable. An all steel unit can be replaced by a door unit . . . panel partitioning by flush partitioning—even during a lunch hour if necessary!

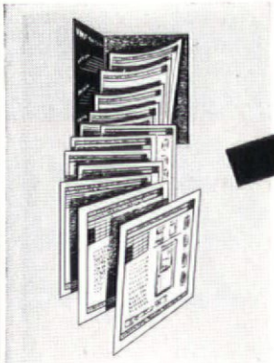
Never before this opportunity for efficient office partitioning combined with permanent cost-cutting flexibility! All made possible by exclusive VMP rolled shape designs which allow assembling from four stock parts of either flush units, glazed units, or panel units. Even industrial type partitioning may be combined quickly and easily.



VMP MOBILWALL PANEL TYPE "FM".

Made by combining the same basic shapes for flush type "FF" with ⅜" thick packed steel or glass panels. The type "FF" interlocks with type "FM" at all post conditions. Thus, you may enclose some areas with flush type "FF", other areas with lower cost but perfectly matching panel type "FM", which is suitable for general offices, corridors, etc.

(Type "FM" MOBILWALL with special adaptors, takes single steel panels in place of either stock standard packed steel or glass panel, which construction is suitable for offices in industrial areas.)



FREE

Twelve two-color architects and builders manual data sheets in attractive binder which fully describe with scale drawings this revolutionary new VMP Mobilwall partition development. Essential for every progressive architect and builder interested in keeping up with new and advanced design data. Please write for your copy — no cost or obligation, of course. Thank you.

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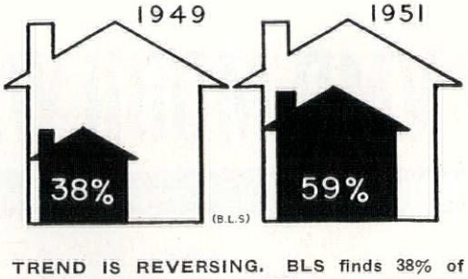
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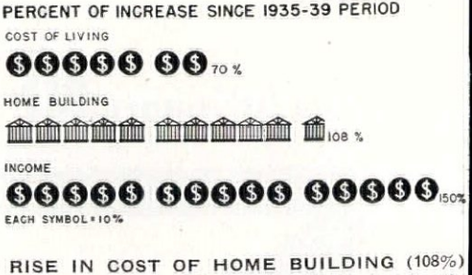
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AVERAGE HOME SIZE (FHA 1-family units) shrank from 1,100 sq. ft. in 1940 to 980 sq. ft. in 1950, but . . .



TREND IS REVERSING. BLS finds 38% of 1949 homes, but 59% of 1951 homes are over 1,000 sq. ft.



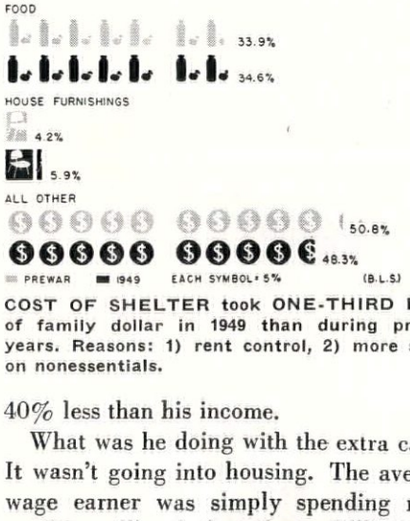
RISE IN COST OF HOME BUILDING (108%) outstripped cost of living rise (70%), but family income rose faster than either (150%).

HOUSING TRENDS: U. S. Homes Are Growing Bigger Again, Better Equipped; But Average Citizen Spends 33% Less for Shelter Than Before the War

What kind of homes are Americans building? How are they heating, plumbing them? What materials are gaining favor; which are slipping? Are home builders keeping pace with other manufacturers in the continuing fight for a share of the consumer dollar? How will future market for housing be affected by age distribution of U. S. population?

Recent reports by the Bureau of Labor Statistics, Census Bureau, and the HHFA added up this month to a gold mine of data on both long and short range trends in housing. They also demonstrated anew the enormous strides made by the housing industry during the last ten years. Herewith some of the larger nuggets from the statistical ore:*

Backbone of U. S. housing demand is the man who heads what statisticians call the nonfarm wage earning family. The fortunes of home builders, dealers, materials producers are closely linked to his welfare. Right now, Mr. non Farm Wage Earner is eating higher on the hog than ever before. His median income, for instance, zoomed from $1,431 in 1939 to $3,577 in 1949—a gain of 149.9%. But in the same ten years, the cost of living as tallied by the Bureau of Labor Statistics climbed only 70%. Even the soaring cost of building a house climbed only 108%—



COST OF SHELTER took ONE-THIRD LESS of family dollar in 1949 than during prewar years. Reasons: 1) rent control, 2) more spent on nonessentials.

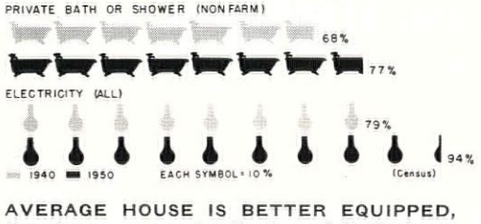
40% less than his income.

What was he doing with the extra cash? It wasn't going into housing. The average wage earner was simply spending more on things like clothes, doctor bills, insurance, recreation, television and horse races. The home-building industry was losing part of its one-time share of consumer dollars. In fact, over the ten year period, Americans (whose families were getting smaller—median number of occupants of houses fell from 3.2 to 3.0) were buying and building smaller houses. The latest trend was the other way around. In 1949, only 38% of U. S. homes contained more than 1,000 sq. ft., but in the first quarter of this year 59% did. BLS discovered the distribution looked like this:

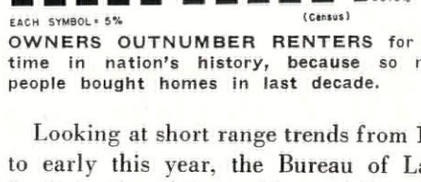
Floor Area	1st quarter 1951	2nd and 3rd quarters 1950	3rd and 4th quarters 1949
Less than 800 sq. ft.	10%	19%	27%
800-999 sq. ft.	30%	35%	35%
1,000 and over sq. ft.....	59%	46%	38%

Into their smaller homes, American packed an ever growing proportion of amenities like flush toilets, shower baths, and electric lights. In 1940, 83% of U. S. homes had radios. By 1950 it was 96%. Homes with mechanical refrigerators increased from 44% to 83% in the same ten years. Even when the census takers counted it up in April a year ago, 12% of the U. S. homes boasted television sets.

With housing both proportionately cheaper—and easier to finance because of the dinky down payments made possible by VA and FHA financing—for the first time in U. S. history there were more nonfarm homeowners than renters. In 1940, 11,413,000 families owned the homes they lived in. In 1950, the homeowner group zoomed to 19,528,000—a spectacular gain of 71%. As a result, the proportion of owner occupied units jumped from 41.1% in 1940 to 53.3% last year, the highest ratio of owner-occupancy on record. Moreover, the *percentage* of owner occupied one- to four-family structures that were mortgaged fell from 45.3% in 1940 to 43.6% last year! (Even with rent control, more than 5 million single family homes remained in the rental market, a drop of only 16% since 1940.)



AVERAGE HOUSE IS BETTER EQUIPPED, than ten years ago despite drag of U. S. slums.



OWNERS OUTNUMBER RENTERS for first time in nation's history, because so many people bought homes in last decade.

Looking at short range trends from 1949 to early this year, the Bureau of Labor Statistics found items like a shift toward aluminum window frames, at the expense of wood, operator-builders' growing share of home building. Often, some of the added space in today's bigger house is devoted to a second bathroom, BLS said. The figures:

	1st quarter 1951	2nd and 3rd quarter 1950	3rd and 4th quarter 1949
Number of houses started..	28,760	114,770	66,760
Average construction cost..	$11,765	$10,130	$9,215
CHARACTERISTICS—% OF HOUSES			
Bathrooms			
One	75	83	85
More than one	23	17	14
Window frames			
Wood	57	60	71
Steel	28	29	24
Aluminum	14	11	5
Type of builder			
Operator	77	73	73
Contractor	12	13	15
Owner	10	14	13

(Percentages may not total 100 because of rounding or the omission of items for which data were unknown.)

* "Housing Characteristics of the U. S.," Series HC-5, Census Bureau; Survey of 1-family houses in Boston, Chicago, Miami, New York, San Francisco and Washington, Bureau of Labor Statistics; Materials Use Survey, HHFA, July, 1951; Income Distribution of U. S. Families, Series P-60, No. 7, Census Bureau; 20-city building cost index, E. H. Boeckh & Associates.

Over the 1940-1950 span, HHFA discovered use of coal as fuel in new homes plunged. Gas and oil gained. The figures:

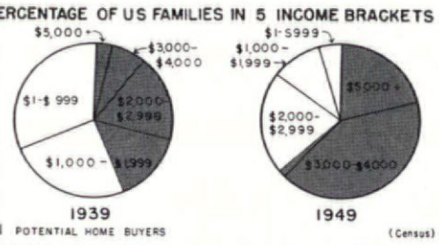
	1940	1950
Gas	49%	60%
Coal & wood	38%	5%
Oil	13%	30%

Electricity began to make a showing, too. In the southeast, blessed by mild climate and cheap power rates, an astonishing 8% of FHA homes built during the first half of last year were electric-heated.

In water pipe, use of copper made significant gains:

	1940	1950
Galvanized steel	70%	55%
Copper	20%	30%*
Brass pipe	9%	15%**

* Tubing. ** Copper or brass pipe.



RISING INCOME makes big group of families potential home buyers for first time.

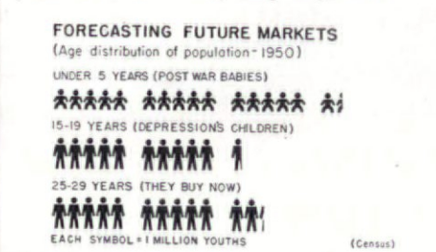
The two-story house all but vanished in southern California, Arizona, New Mexico. It was built most often in the conservative northeast and Great Lakes. The national picture:

	1940	1950
1-story	67%	86%
1½ & 2-story	33%	14%

Basements grew 14% less popular, giving way to crawl space or slab on grade:

	1940	1950
Full basements	50%	36%

After subtracting losses, new homes and conversions in the last ten years produced a startling one-third increase in the nation's nonfarm housing inventory—from 29,683,000 to 39,390,000 units—greatest gain for any decade on record. Now, 21% of U. S. residents lived in housing under 10 years old. In 1940, only 16% did.



FUTURE HOUSING BOOM should be caused by World War II baby crop, but first comes potential slump.

Did this portend a long term slackening of housing demand ahead—even without counting the effects of materials and credit restrictions? The answer: not at all. The number of depression's children now growing up to the age of marriage (and the need for a home) was on the down grade. This trend will continue until the mid-1960s. But after 1965, it will reverse as the bumper crop of World War II babies begins having its own children—and goes house hunting.

For the next few years, therefore, builders in nondefense areas will have to concentrate on selling bigger or better homes to people with children (the ranks of children under 5 jumped 54% between 1940 and 1950). People with kids would need more space. But they would also be price conscious. By 1965, however, there would be a new tide of families formed by today's kindergarten tots. It should continue well into the 1970's. Enterprisers who live to participate at that far off housing boom should die prosperous.

Few Builders Cut Home Prices Despite Drop in Materials Costs, Sales Slump

As builder Avery Mays of Dallas said, "The home market is still in the doldrums." What to do about it was becoming more and more vital to builders.

Despite the three month old slump few were shaving prices—*yet*. Instead of bowing to the elementary law of supply and demand, cutting prices to keep volume up, most builders preferred to let sales volume shrink. The slide in lumber, paint, masonry prices looked only temporary. For instance, Atlanta dealers said their price war to unload a glut of lumber, cement and gypsum was over.

A forthcoming increase in freight rates would wipe out savings on materials anyway. In Portland, Ore., heart of the western fir and pine belt which produces more than half the nation's softwood lumber, green common framing fir that brought $80 per thousand feet last spring slid as low as $65 a month ago, but rebounded to $72. Pine prices, which bounce less and slower than fir, still showed no sign of recovery. No. 3 boards were being sold by some mills as low as $74. Peak spring price was $93. Some pine men were even predicting more minor declines before the turn comes. Labor costs were on the rise. In San Francisco, for instance, carpenters received a 7½ cents an hour raise to $2.45. Laborers won a 5½ cents hike to $1.70.

Staffs cut. Builders continued big lay offs, blaming Regulation X for their inability to sell more homes. The Bureau of Labor Statistics, after a survey of the New York area, forecast Regulation X would produce a 20% drop in the number of 1-family homes built between the second and third quarters.

In San Jose, Calif., Ex-President David Bohannon of NAHB began a 1,000 home development in the $10,000 range with peak employment of 160 men. But a gala Sunday opening of two model homes with 900 visitors produced not a single sale. Bohannon trimmed his plans to 40 houses, fired 62 carpenters, 35 laborers. In Cleveland, Builder N. F. Molnar laid off 11 carpenters. In Seattle, Vice President George Coplen of Modern Home Builders, Inc. said, "Our organization has been cut from 325 to less than 100. The damage will be difficult to mend if something isn't done soon. We're trying to solve our problem by going into general contracting." First job: a $200,000 school in Ephrata, Wash.

President E. Poole of Art Craft Builders, Inc. in Denver reported, "We had 17,000 people visiting our development last weekend—just from newspaper advertising—but didn't sell a single house."

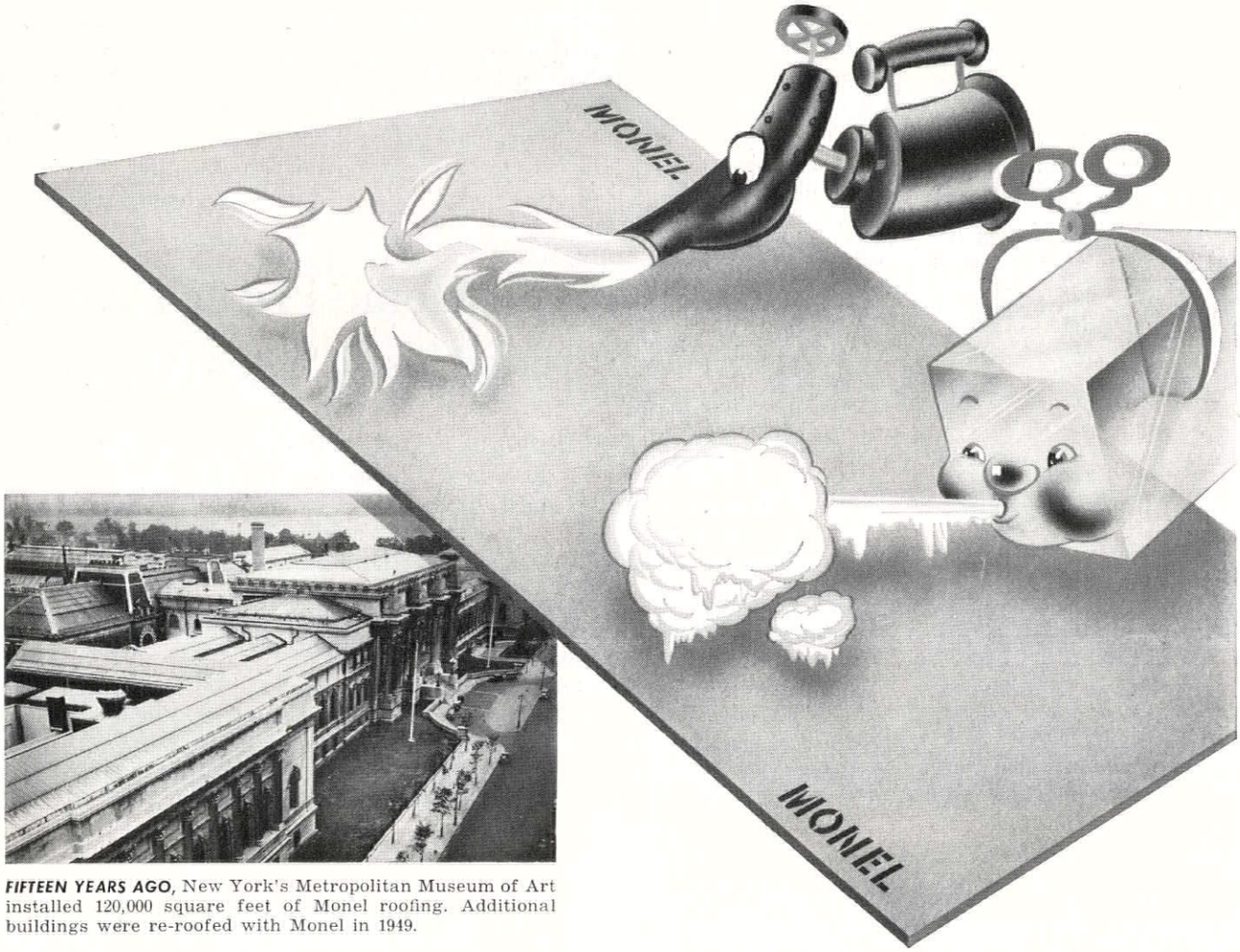
Free gimmicks. In Los Angeles, there was a 22% rise in real estate display advertising in the newspapers. Some builders were advertising free ranges, refrigerators, life insurance for the duration of the mortgage. Builders in hilly sections of the sprawling city like coastal Malibu faced a special problem: where television reception was cut off in valleys, virtually nobody would buy houses. Said one salesman: "If you tell a prospect TV reception is bad, you don't sell the house."

If the sales slump lasted long enough, builders might well begin to slash prices. One of the first to do so was Edward Rose Building Company in Detroit, which trimmed prices $700. Explained Irving Rose: "I figured by the time our sales agreements were translated into finished homes our costs would have dropped that much. It turned out to be a good guess."

U. S. ON THE MOVE

The moving business, which soars in either boom or bust times, is amid what promises to be its record year. The 4,000 firms who haul household goods in interstate commerce foresee six million loads. Major causes include decentralization of industry, rising defense activity.

(NEWS continued on page 68)



FIFTEEN YEARS AGO, New York's Metropolitan Museum of Art installed 120,000 square feet of Monel roofing. Additional buildings were re-roofed with Monel in 1949.

A roofing sheet to remember

for protection from buckling and cracking due to heat and cold!

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At the moment —because of the demand for nickel and nickel alloys in the defense program—the use of Monel for building applications is prohibited by Government order.

But the time will come again when there is enough Monel available for roofing! Meanwhile, INCO can help you in planning for the future. Call on our Architectural Section for technical information and literature.

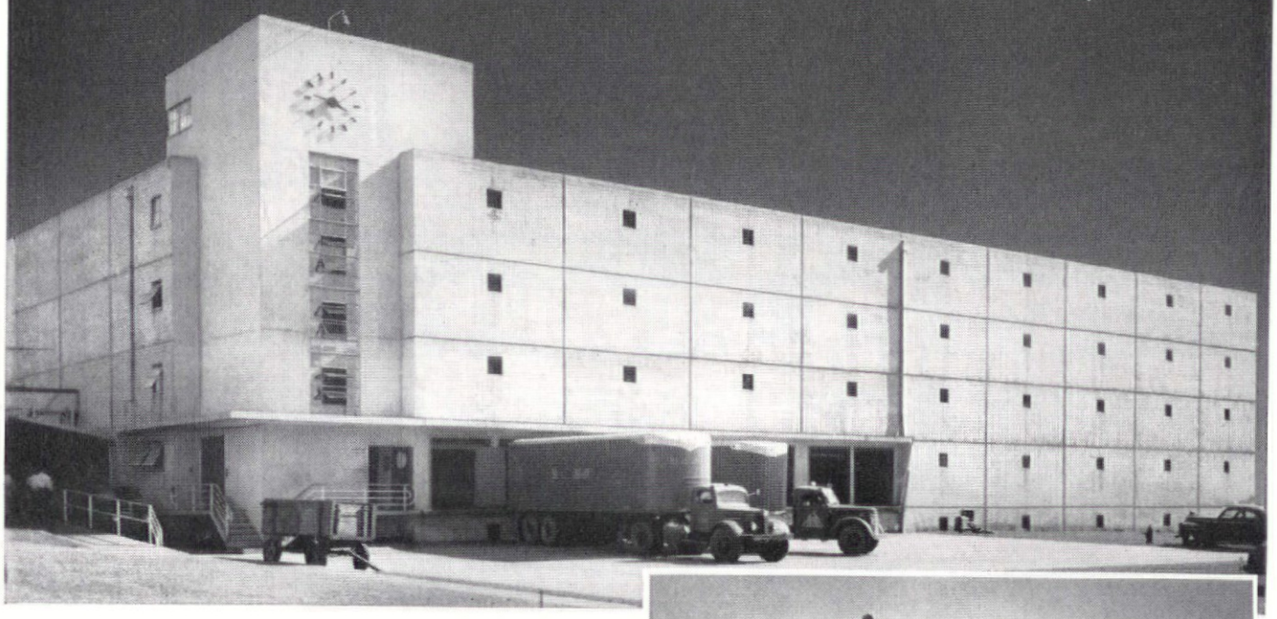
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67 Wall Street, New York 5, N. Y.

INCO TRADE MARK

MONEL ..."*For the Life of the Building*"

Architectural Concrete

ideal for industrial buildings for any purpose



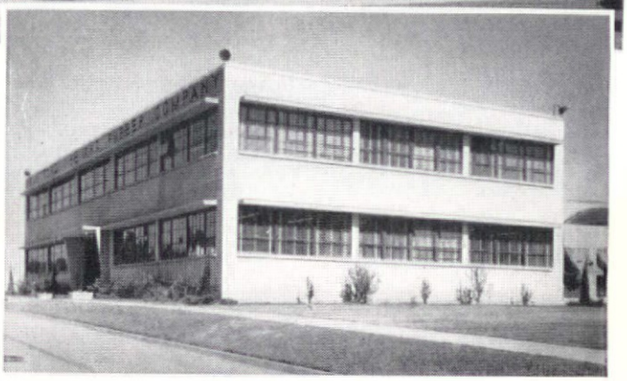
THESE modern buildings are part of the large Armstrong Tire & Rubber Co. plant in Natchez, Miss. They demonstrate the adaptability of architectural concrete to industrial structures.

The warehouse and engineering building (top and bottom photos) are part of the original plant built in 1938-40. Today these buildings are still attractive and new-looking; yet no maintenance has been required. One cement grout coat was applied to the engineering building in 1946 to harmonize with the new office building. So satisfactorily have these buildings performed that all new additions, including a new office building built in 1945 (middle photo), were designed in concrete.

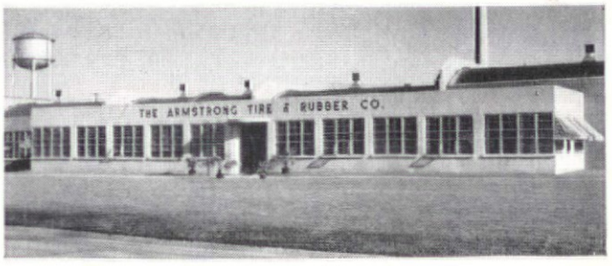
Architectural concrete stays new-looking because it has great resistance to weathering. Maintenance expense is low because concrete's durability reduces repairs and upkeep to a minimum.

In addition to rugged durability, beauty and low maintenance expense, architectural concrete offers maximum firesafety and strength, moderate first cost and long life. Moderate first cost, low maintenance cost and long life result in ***low annual cost.*** Even ornamentation is economical, for it can be cast integrally with structural parts.

For more information write for free, illustrated literature, distributed only in the U.S. and Canada.



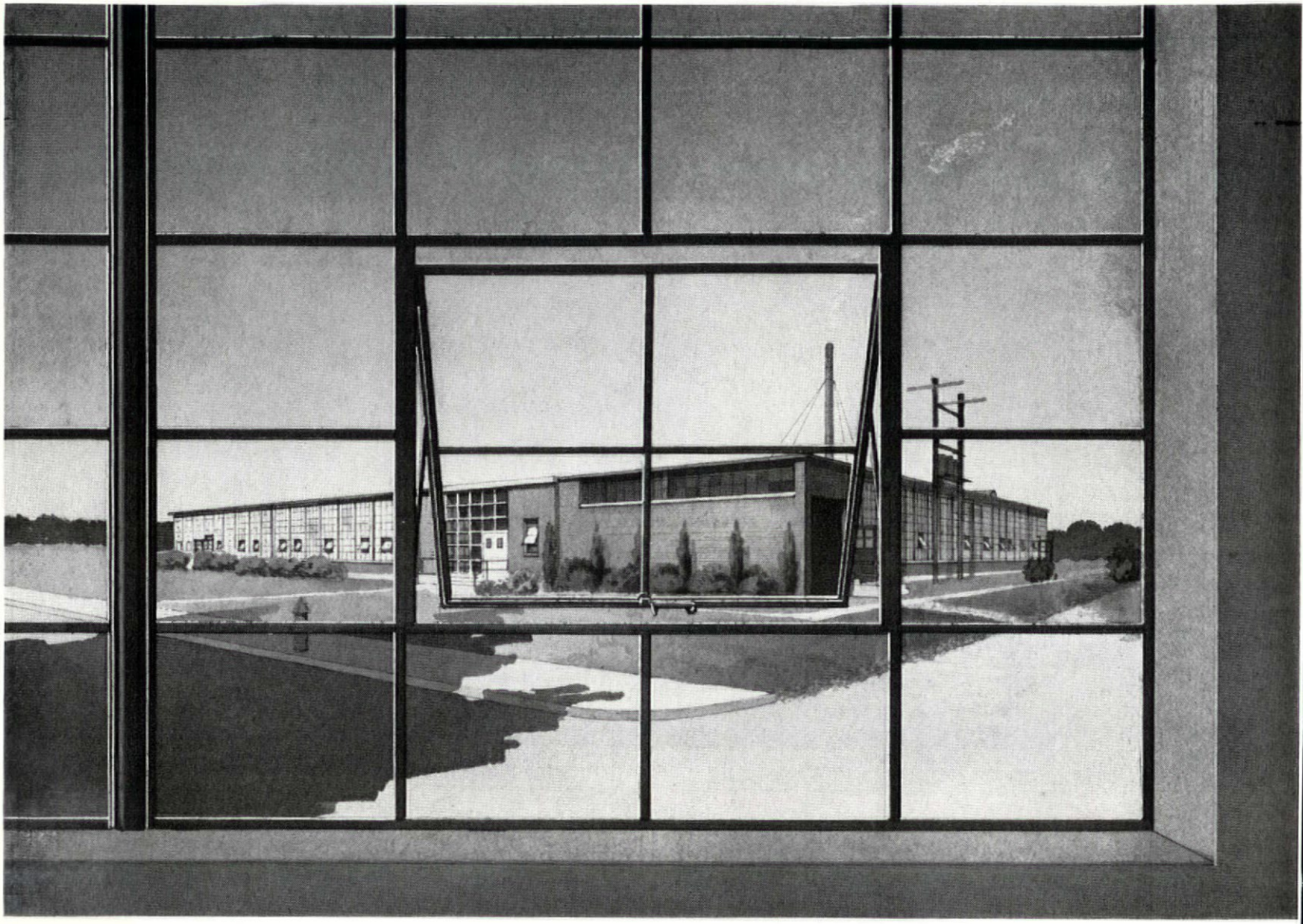
Large photo above shows rubber storage warehouse of the Armstrong Tire & Rubber Co., Natchez, Miss. Small photo above shows architectural concrete office building. Photo below shows original office building now occupied by the engineering department. James T. Canizaro, Jackson, Miss., architect for the entire project and structural engineer for the office building. Roberts & Schaefer Co., Chicago, was structural engineer for the factory and the engineering building. H. N. Howe, Memphis, was structural engineer for the warehouse. Hillyer & Lovan, Jacksonville, Fla., was contractor for the warehouse and the office building. B. L. Knost, Pass Christian, Miss., was contractor for the factory and the engineering building.



PORTLAND CEMENT ASSOCIATION

DEPT. A8-7, 33 WEST GRAND AVENUE, CHICAGO 10, ILLINOIS

A national organization to improve and extend the uses of portland cement and concrete through scientific research and engineering field work



Harvey Clothing Co., Inc., Quakertown, Penna. Engineers and Contractors: Brown and Matthews, New York.

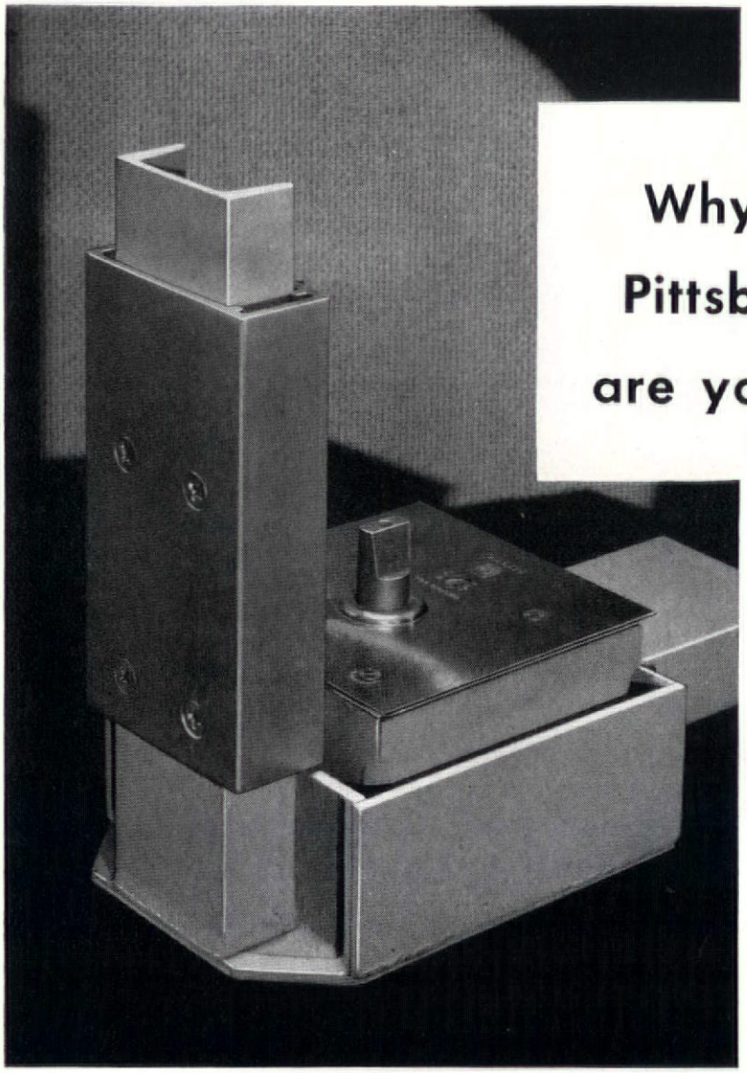
Pictured above are Lupton Commercial Projected Metal Windows—low cost dependability with long life. They offer more daylighting and better ventilation than any other type of window at comparable cost. Precision-made of hot rolled steel, with ventilators welded for extra strength, they will not shrink, warp or swell. Walls of windows, like these, can mean savings too—often cost less than masonry construction.

When you design — keep Lupton in mind. There is a Lupton Metal Window for every type of building. Backed by over 40 years of experience in the window industry, the Lupton name is your guarantee of a quality product. One you can specify with confidence. You'll find our Catalog in Sweet's — or write direct for your copy.

MICHAEL FLYNN MANUFACTURING CO.
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LUPTON METAL WINDOWS

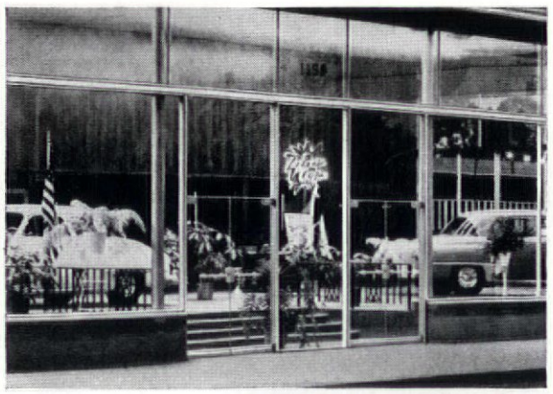


PRECISION WORKMANSHIP is readily apparent in this cutaway view of a base corner of a Pittsburgh Doorway. Frames are sturdily built, with close attention given even to so-called minor details. The Pittco Checking Floor Hinge is accurately positioned and then firmly anchored in the base receptor. Although this base construction is concealed by the finished floor, it is good to know that there are no "hidden headaches."

Why precision-built Pittsburgh Doorways are your logical choice

● Careful, quality fabrication marks every detail in the construction of Pittsburgh Doorways. The absolute accuracy of all dimensions is assured through the use of special checking gauges by expert craftsmen. This eliminates time-consuming calculations, as well as costly details of fitting, locating and fabricating in the field. When the frame reaches the job-site, it is simply unpacked and bolted into the building opening. Everything is included in one "package" for the quick, easy and accurate installation of the Herculite Doors, sidelights and transom glass. Twelve standard and four free-standing frames are available to meet almost any need.

All this means a highly satisfactory and dependable doorway, with a sizable reduction in on-the-job costs. That is why we urge you to consider the *total-installed* cost—not just the *list price*—when you specify doorways. When you do so, you can reach but one conclusion: Pittsburgh Doorways offer the utmost value—in quality, precision manufacture, ease of installation and final cost. Why not write today for full details to Pittsburgh Plate Glass Company, 2214-1 Grant Building, Pittsburgh 19, Pa.?



Pittsburgh **DOORWAYS**

PPG

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PITTSBURGH PLATE GLASS COMPANY



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Dealerships are still available in certain areas. For complete information, write Dept. F-6.

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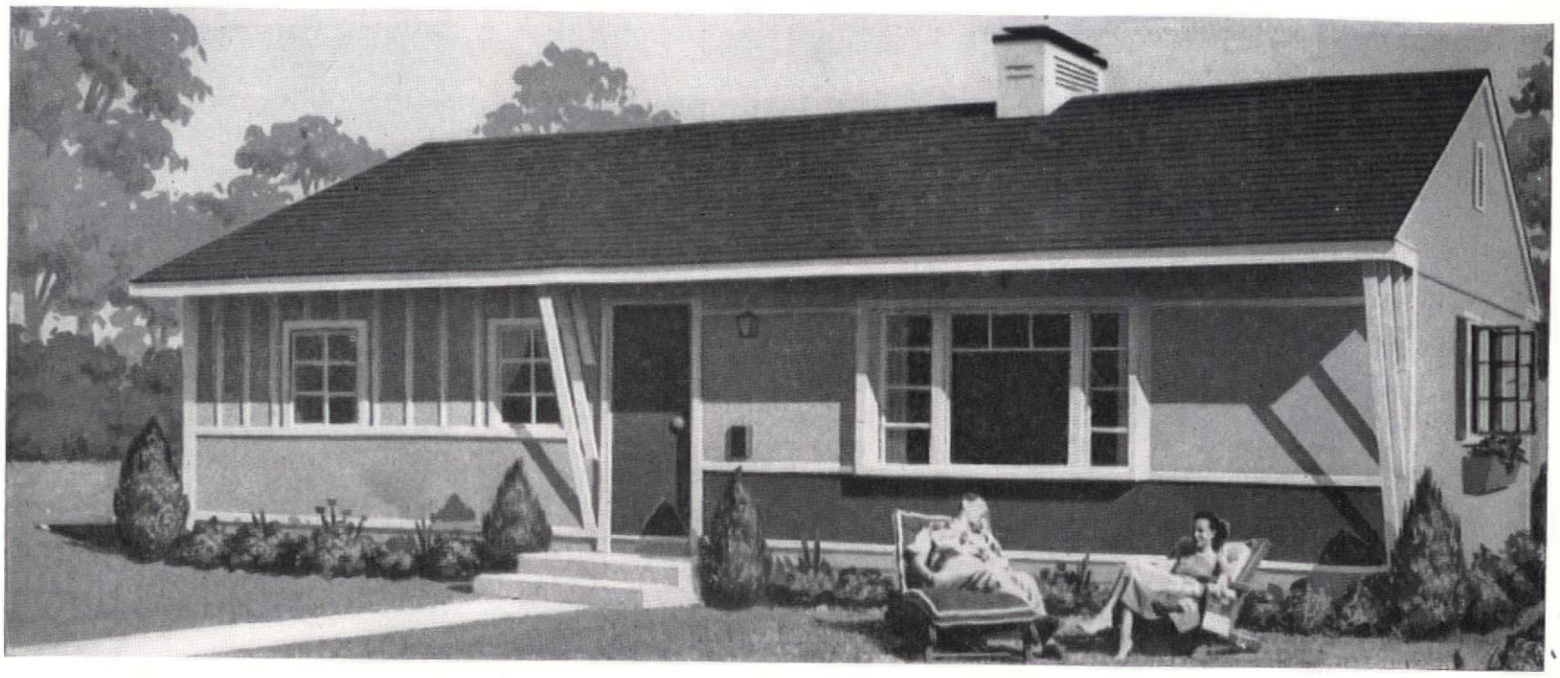
Manufacturers of Gunnison *Coronado* and CHAMPION Homes...

Gunnison Homes INC.

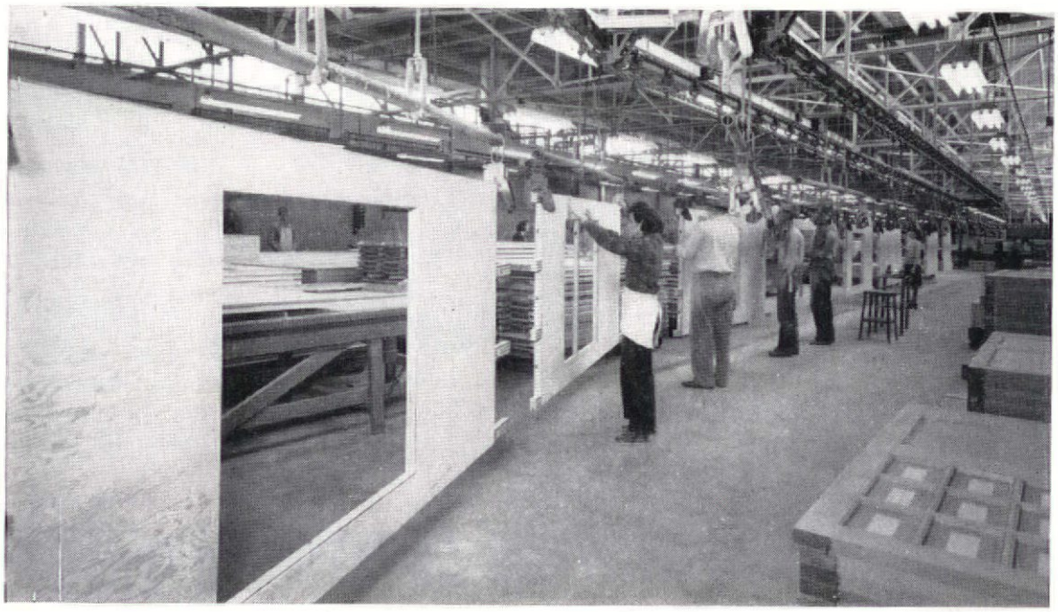
UNITED STATES STEEL USS CORPORATION SUBSIDIARY

NEW ALBANY, INDIANA

"Gunnison," "Coronado" and "Champion"—T.M. Gunnison Homes, Inc.



THE CORONADO, new-model Gunnison Home, is available in five sizes . . . two or three bedrooms . . . two elevations.



TWENTY-FIVE MINUTES is time enough to produce a home on the efficient Gunnison production line. Photo shows the quality-control inspection prior to the application of finishes.

Typical uses of penta-treated wood

Wherever wood is used, penta treatment will give it longer life. The following table gives the amount—in pounds—of 5% penta solution in oil that a cubic foot of wood should retain for maximum protection.

	Humidity average to low	Humidity average high
Sills and plates	6	8
Joists and girders	6	8
Screeds and subflooring	6	8
Factory flooring	6	8
Roof plank	6	8
Platforms and decking	6	8
Posts and fences	6	8
Cooling towers	—	8-10
Sign material	6	8
Millwork	6	8
Highway guardrails	6	8
Railway cars	6	8
Bridge timbers	8	10-12
Utility poles	8	8-10
Crossarms	6	8

Note: Higher treatments are recommended where wood is to serve under severe conditions, such as in the tropics. Recommendations will be furnished on request.

"You are assured of VALUE . . ."

"You are assured of VALUE when you buy a Gunnison Home," says Gunnison Homes, Inc., subsidiary of United States Steel Corporation, "because only the finest materials and craftsmanship go into the manufacture of these 'homes of tomorrow'!"

Wood, treated with Monsanto Penta (pentachlorophenol), is one of the assured-value features of Gunnison Homes. The Gunnison factory, at New Albany, Indiana, applies penta to the base of studs and the gutter end returns of all its homes. Gunnison dealers are instructed to penta-treat other important parts of the structures.

Water-repellent formulations of Monsanto Penta provide dimensional stability which is important in prefabrication. In the case of Gunnison Homes, penta formulations are *clean*. The treated wood can be painted, varnished or given any of the modern finishes.

Monsanto Penta adds years to the life of wood by protecting it against termites and other wood-boring insects and by preventing decay caused by fungi. It is a stable chemical that gives lasting protection. It does not leach. Rain and ground water do not dissolve penta and carry it away.

Whether you employ wood in trim or for heaviest structural timbers, you can give it longer life with Monsanto Penta. Write for information on penta and for names of suppliers of penta-treated lumber, penta solutions or custom-treating service. MONSANTO CHEMICAL COMPANY, Organic Chemicals Division, 1752-G South Second Street, St. Louis 4, Missouri.

DISTRICT SALES OFFICES: Birmingham, Boston, Charlotte, Chicago, Cincinnati, Cleveland, Detroit, Houston, Los Angeles, New York, Philadelphia, Portland, Ore., San Francisco, Seattle. In Canada, Monsanto (Canada) Ltd., Montreal

MONSANTO
CHEMICALS — PLASTICS

SERVING INDUSTRY . . . WHICH SERVES MANKIND

Harwell Harris, Named by Univ. of Texas

Harwell H. Harris, 48, of Los Angeles, who reached international fame in architecture while practicing as a "designer" because California's registration board refuses to relent its jots and tittles, was named head of the University of Texas' department of architecture and planning. Read Granberry, assistant to the president, explained the university sought a man whom Texas architects would respect and admire and whose ability in the field of design was unchallenged. Harris will take up his new duties next spring, when the architectural department will be freed for the first time from domination of the School of Engineering. In recent terms, the architectural department has been headed by professors in revolving series. As a professor, Harris will be permitted to continue some private practice, on the theory prevailing in architectural schools like MIT, Harvard and University of California that a man who keeps his hand in makes a better teacher.



Blackstone Studios

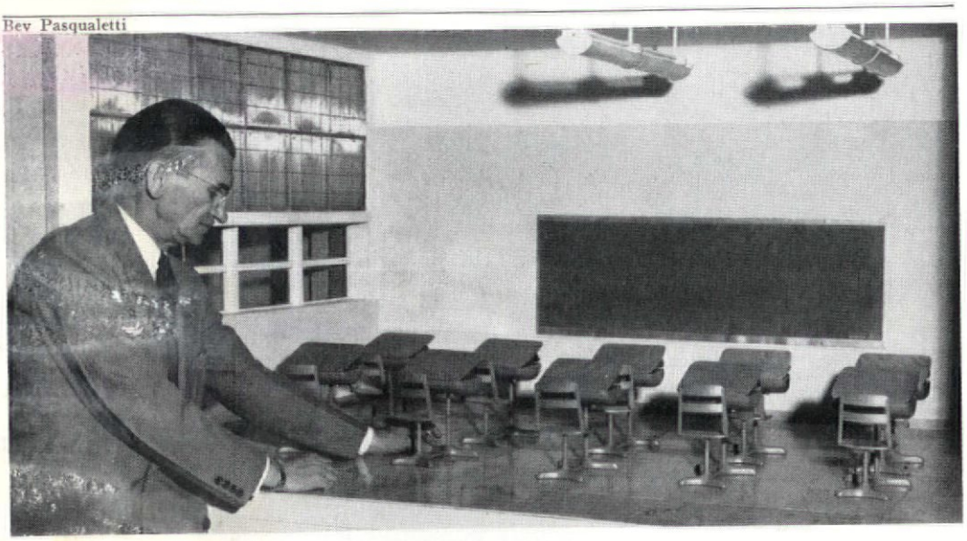
Architect **O'Neil Ford** of San Antonio stirred British architectural circles with a series of six lectures on the Youtz-Slick lift-slab construction method which he pioneered architecturally. In London, Ford's opening talk was sponsored by W. H. Colt Ltd. because, as *The Architects' Journal* reported, "the architectural and engineering societies turned it down through reasons of indifference, short notice and refusal to sponsor a talk on a 'commercial product.' *How absurd . . .*" *The Journal* hazarded a forecast that though "our slow moving, conservative industry" will not adopt lift-slab for "some time," British students "will be jacking floor-slabs all over the country by next Christmas (on paper, of course, where most of the good ideas stay, in this country)."

Maj. Gen. Thomas F. Farrell, 59, on leave from his post as chairman of the New York Housing Authority, quit as deputy director of the Defense Production Administration to become assistant general manager for manufacturing of the Atomic Energy Commission. He will take charge of AEC's whopping plant construction program (biggest item: $900 million hydrogen bomb materials plan at Aiken, S. C.)



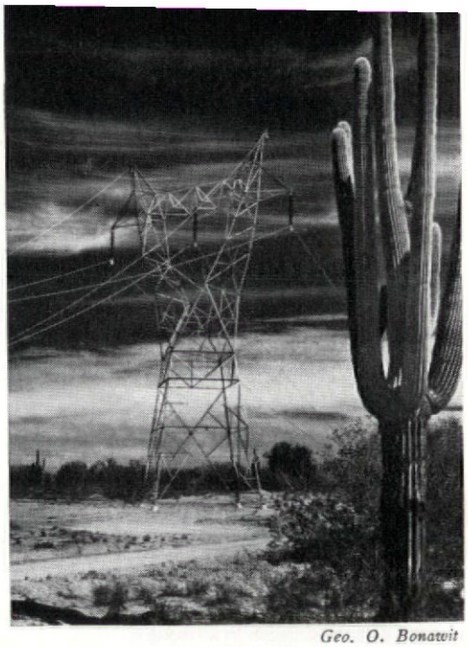
Eli Aaron

Bev Pasqualetti



SCHOOL PLANT PLANNING LABORATORY opens at Stanford

Stanford University last month opened a five-room School Plant Planning Laboratory in the basement of its aggressive, expanding School of Education. Inside, by Stanford computations, was $70,000 worth of what every young school superintendent should know. Samples: six models demonstrating experiments in color, light, heat and ventilation; a luminous ceiling; model exterior walls, school plumbing, classroom furniture, and materials donated by 60 makers of equipment and materials. Energetic director is Dr. James D. McConnell, associate dean of Stanford's school of education. Also prominent in laboratory plans was Dr. Darell Boyd Harmon shown above inspecting scale model classroom. For Harmon, former school health director for the Texas Health Department, Stanford is a fresh pasture as visiting professor in education. Though some San Francisco Bay area architects regard the education school's lab as a flagrant encroachment on architecture's domain by educators who would relegate designers to the role of draftsmen, no public bickering has developed yet on the Palo Alto, Calif., campus. Stanford's architecture department is a wing of the art department.



Geo. O. Bonawit

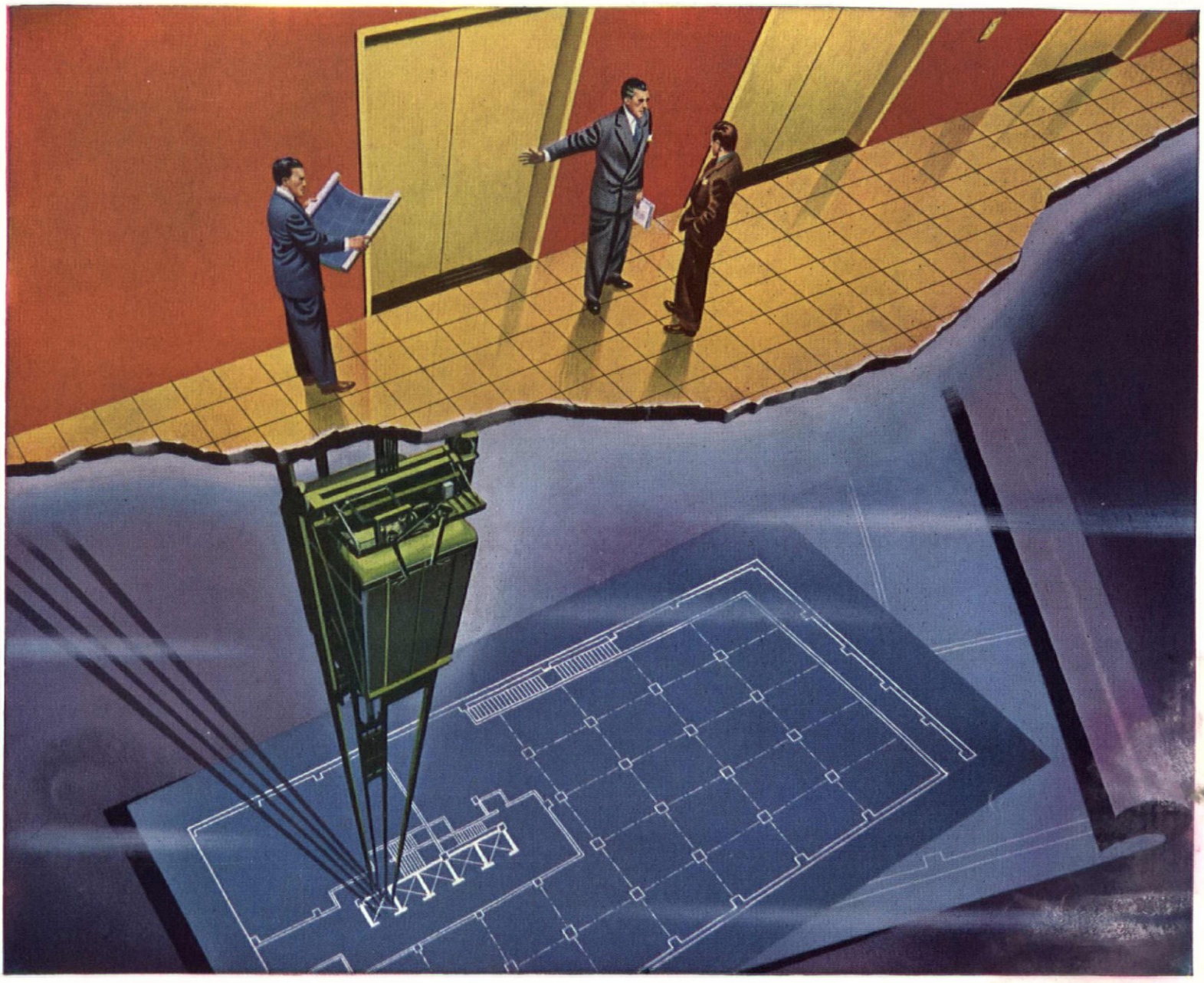
CACTUS & CATENARY CURVES

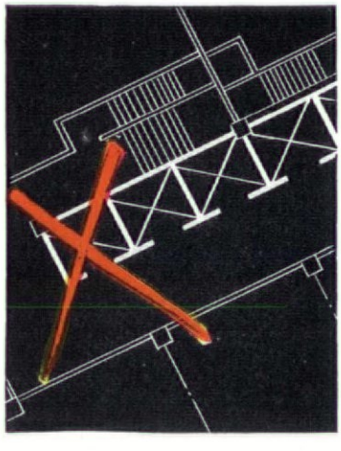
which will make the commission the largest consumer of electric power in the U.S.

In Florence, Italy, while pages in medieval costume blew a trumpet flourish, Architect **Frank Lloyd Wright,** 82, was presented with the Italian Star of Solidarity decoration at the opening of an exhibit of his designs. Near Phoenix, Ariz., he was presented with a headache: 1,500′ from his desert home, Taliesin West (chosen for its remoteness and stark beauty), the Bureau of Reclamation turned on the juice in a 230 kv. power line which Wright considers "desecrates nature and my view." The towers lie on land Wright leases from the State of Arizona, but a clause in the lease gave the State the right to grant easements for power lines. Reclamation Engineers claim the wires have "a beautiful catenary curve," explain it would cost $10 million to bury four miles of line visible from Taliesin West. Result: Wright threatens to move. He told Phoenix friends he has taken an option on land north of Tucson in the Catalina Mountains where he hopes an architect can be left alone on his desert.

Died: **Robert T. Brooks,** 73, retired executive vice president of the American Institute of Steel Construction, July 2, in Minneapolis; Architect **John Walter Cross,** 73, designer of Manhattan skyscrapers, July 25, at Hot Springs, Va.

First Japanese architecture teacher to visit the U. S. since war's end lectured to architecture students at North Carolina State College midway in a four month tour of the U. S. Said frail, polite **Tsutoniu Ikuta,** 39, of University of Tokyo: "There is much we can learn in America, but there is also much that is . . . ah . . . funny."





AN ELEVATOR YOU'LL NEVER NEED

New elevator developments give planning engineers an opportunity to use fewer cars—*while actually improving elevator service!*

Take modernization. Even though a building's traffic hasn't changed, elevatoring has. It's faster. The magic of modern electronic supervision has greatly reduced passenger waiting time. Automatic car operation has reduced travel time. Fewer cars are needed.

In existing buildings, Otis planning engineers survey actual elevator traffic. For new buildings, they anticipate traffic patterns by studying a building's location, layout, expected usage, population. Then they evaluate all factors to determine the number of cars, their size, speed and controls—*using a background of experience that is unequalled anywhere!*

From management's viewpoint, careful elevator planning means the increased prestige of unexcelled elevator service, the income from recaptured or additional floor space, the economy of installing and operating fewer elevators.

Add Otis *elevator* planning to Otis *elevator* research, engineering, manufacturing, construction and service and you have the reasons why the Otis trade-mark is the symbol of the world's finest elevators and escalators. **Otis Elevator Company, 260 11th Ave., New York 1, N. Y.**

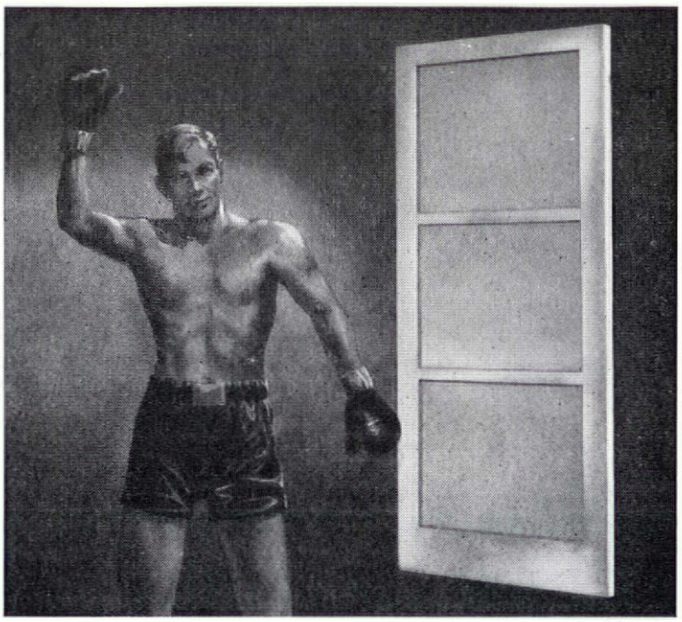
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*The quality group of door manufacturers is comprised of mills inspected regularly by the Fir Door Institute inspection service. This service is a check on quality completely independent of individual mill supervision. The doors produced by these manufacturers carry FDI grademarks:

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Cruver Door Company
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Everett Plywood & Door Corporation
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M and M Wood Working Company
Portland, Ore.

E. A. Nord Co., Inc.
Everett, Wash.

Puget Sound Manufacturing Co.
Tacoma, Wash.

Simpson Logging Company
Seattle, Wash.

Vancouver Door Company
Montesano, Wash.

The Wheeler Osgood Company
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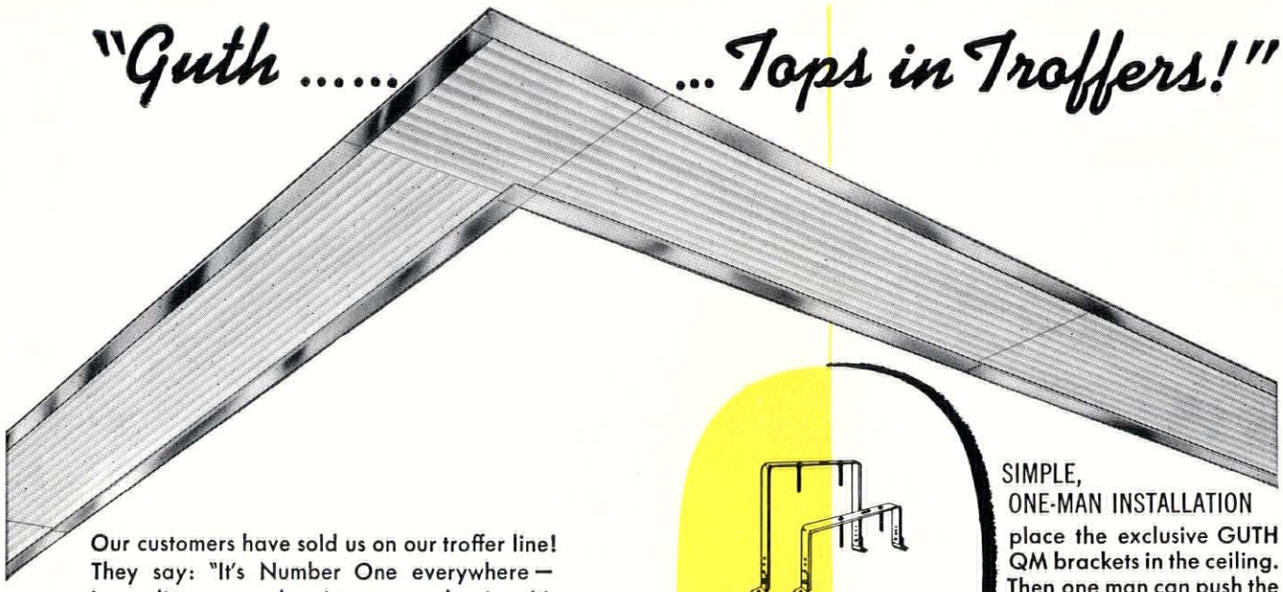
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Your application for new construction under current NPA regulations will have a better chance of getting approval if you design for reinforced concrete. That's because reinforced concrete construction requires less steel—60 to 65% less on the average structure! Furthermore, reinforced concrete is a wise choice in these days of steel shortages, since reinforcing bars—classed as a "B" product—will probably be easier to obtain.

Reinforced concrete is rugged, durable, inherently firesafe, and highly resistant to wind, shock, and quakes. On your next job, it will pay you to design for reinforced concrete!

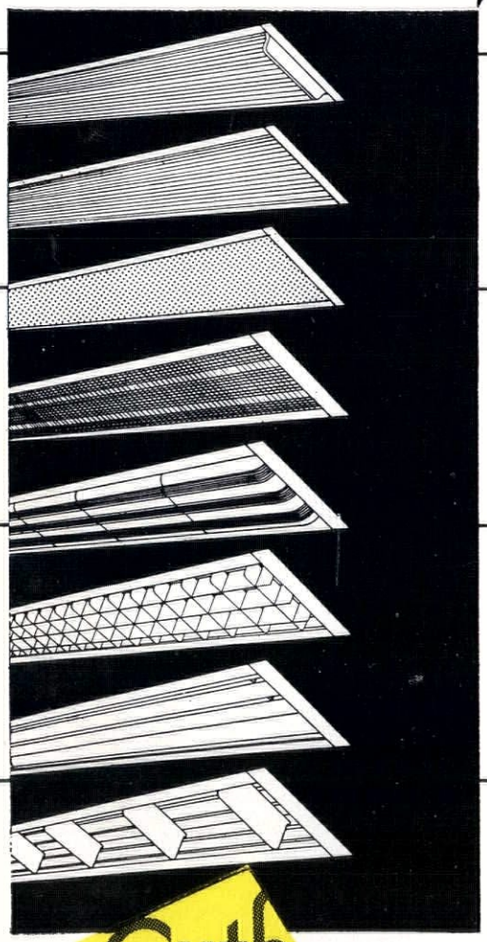
CONCRETE REINFORCING STEEL INSTITUTE
38 S. Dearborn St., Chicago 3, Ill.

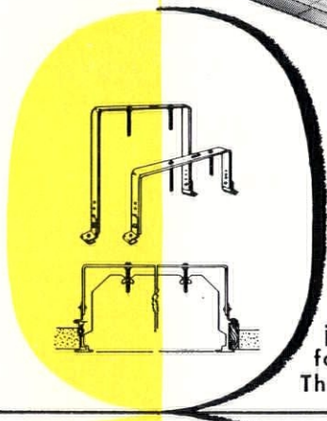
"Guth ....Tops in Troffers!"



Our customers have sold us on our troffer line! They say: "It's Number One everywhere — in quality, comprehensiveness, and price. It's great!"

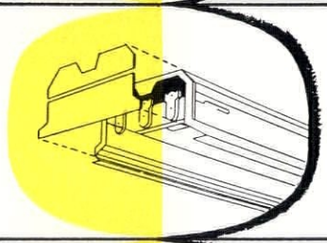
Look how easy it is to install and maintain GUTH Troffers:





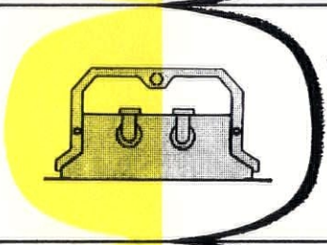
SIMPLE, ONE-MAN INSTALLATION

place the exclusive GUTH QM brackets in the ceiling. Then one man can push the Troffer into place. Brackets grip the Troffer automatically, allowing it to be adjusted for perfect fit and fastened with wing nuts. That's all — simple, isn't it?



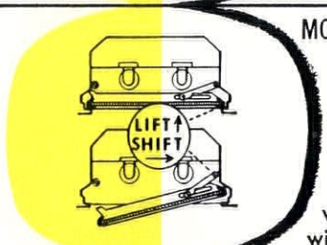
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wires are pulled through quickly and easily. How the contractor loves this feature!



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glass framed and eggcrates are hinged for easy relamping and cleaning. Slide-in reflectors are easy to remove and replace — no latches or nuts to bother with. Ballast can be replaced without removing fixture.

UNBROKEN RIBBONS OF LIGHT

no metal joints — no divider shadows.

1-, 2-, 3- AND 4-LAMP SIZES

all with the same cross section — may be combined for perfect fit in one "strip".

ALL POPULAR LIGHT SOURCES

top lighting efficiency with Standard, Slimline, and Low Brightness lamps — in a total of 24 wattage sizes.

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vinyl-bright
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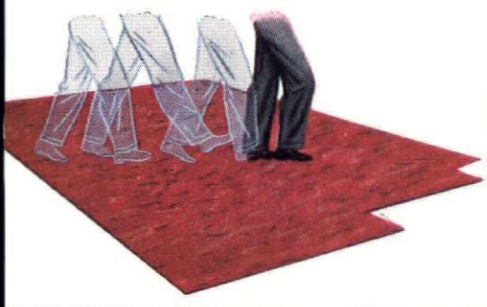
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Flor-Ever is NON-POROUS—which means soil cannot grip into the extra-smooth surface and is wiped off *faster,* with *less effort.* No animal, vegetable or mineral oil, grease or fat can ever stain, soften or in any way damage Flor-Ever.



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Flor-Ever is solid Vinylite clear through to the Permo-Seal back: It therefore is amazingly resistant to abrasion and cannot be stained, discolored, softened or otherwise harmed by the harshest soaps, cleaners, detergents, chlorides or household bleaches.



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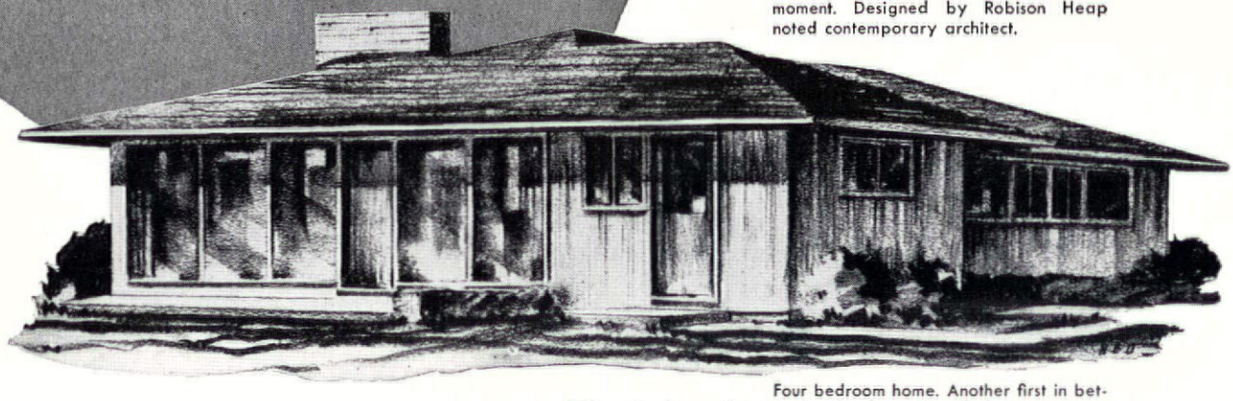
The Crestwood

Three bedroom home for more and better living designed by Schwarz and West —A.I.A.



The Eastwood

Two bedroom home. Modern as this moment. Designed by Robison Heap noted contemporary architect.



The Archwood

Four bedroom home. Another first in better housing by nationally known contemporary architect Oskar Stonorov—A.I.A. —A.I.P.

These Peaseway "New-Design" homes are big news in the home-building market, because they are the FIRST prefabricated CONTEMPORARY design homes in America. But big as this news is, the Peaseway Archwood, Eastwood and Crestwood are only three of the many excellent "reasons why" you as a builder should investigate the fine profit possibilities in the complete line of Peaseway prefabricated homes.

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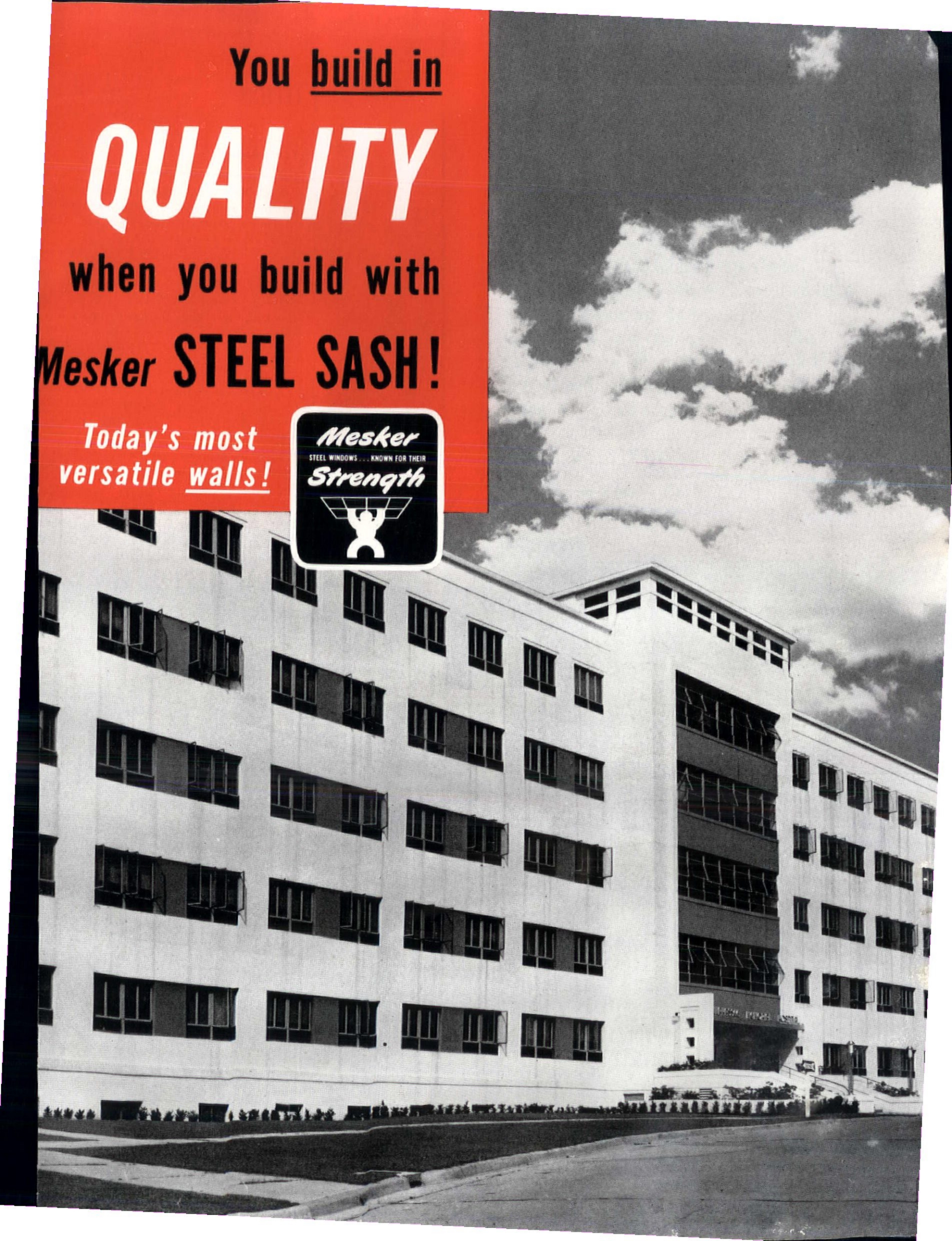
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Today's architectural needs call for Mesker Steel Sash, windows with today's modern design, trim lines, and all the artistic appeal it's possible to design into a window. They're a product of quality-conscious craftsmen, assembled in Mesker's highly perfected mass production facilities. They're inspected repeatedly during manufacture to assure smoothly welded joints, closely mitered corners, well fitted, tightly closing vents . . . the window you instantly recognize as MESKER.

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LETTERS

Young Architects

Sirs:

Every time that I decide that our practice not worth while, something like your June issu on Young Architects comes along and I forg the struggles involved. . . .

PAUL M. RUDOLPH, *Archite*
Sarasota, Fla.

Sirs:

The June issue looks very good. It has a ge eral flair which gives the imagination a lift.

JACK DUNBAR
Harper's Bazaar
New York, N.

Sirs:

An excellent job, provocative and stimulatin

HENRY HILL, *Archite*
San Francisco, Calif.

Sirs:

Congratulations on your June cover. Your p torial index is the best cover idea I have ev seen. . . .

PAUL A. BUTKERE
Merrick, N. Y.

Sirs:

I enjoyed reading your June issue. . . . T symposium was exceedingly worthwhile a made my contemporaries seem very articula How much did you put into their mouths?. .

HARRY WEESE, *Archit*
Chicago, Ill.

• Not a word.—Ed.

DESPITE FHA AND CODES

Sirs:

I bought half of "The Economical Dupl featured in your May issue (p. 132).

My neighbors, after studying Architect Go man's original plan, agree that we would h liked the orientation of the proposed sche the contrast between the second floor fra overhang and the brick, as well as the result 38 additional sq. ft. of floor space—all of wh were vetoed by FHA and local building cod

Builder Shapiro, in spite of handicaps, given us homes that stand head and shoul above our hackneyed surroundings.

Cheers for Architect Charles M. Goodn Down with the bureaucrats!

1ST LT. RICHARD A. Coo
Arlington, Va.

CODES AND WASTE

Sirs:

I have read with interest your editorial in May 1951 issue entitled *Will the Courts Enf Waste?* and want to commend you for expos practices that are wasteful and extravagant the average home purchaser.

As pointed out in the editorial, the ave individual cannot afford to fight the battle a With the help of your magazine and others public can be informed and the task of remo unnecessary requirements can be made effe

AVERY MA
Avery Mays
Dallas, Tex

irs:

. . . I am a sincere believer that a good many f the existing building codes in this country are bsolete by as many as 20 to 30 years and should e replaced by new up-to-date codes with as little elay as is possible.

Without question because of climatic condi- ons various sections of the country will require anges from a master code. However, I do be- eve that the B.O.C.A. should promote the Na- onal Code. . . .

EARNEST W. MAUER, *Pres.*
The Maurer Co.
Rochester, N. Y.

irs:

We commend you on your recent exposure of e possibilities of economies in our codes. I am re that every subscriber is as sold on this drive you are. It is a tough job which you have dertaken but it is the biggest step toward iminating feather-bedding. Feather-bedding ll end eventually in national obliteration com- rable to the destruction of the Roman Empire, we permit it to proceed unimpeded to its entual conclusion. Please don't stop your work.

JAMES D. HARVEY
Chicago, Ill.

s:

I add my commendation. . . . It takes courage expose the useless and wasteful building codes t have been promoted by both the unions and tain industries in the past decades.

am sure that your articles will stimulate e active objection to the continuance of ny of these archaic practices.

H. E. PERL
State Electric Supply
Oakland, Calif.

:

think a court test of some of these wasteful requirements would be a very constructive e, but it is not a job for the individual der. It should be undertaken by trade asso- ons because, as many builders know, "fight- city hall" is a very dangerous pastime when same city hall group has the power to super- your construction.

ou are performing a very constructive func- and a real public service. I wish to con- ulate you upon your initiative. . . .

ARNOLD H. COHN
Best Construction Co.
Cleveland, Ohio

hen you have the code makers in a mood to t reasonable changes in requirements, I st that you then turn your attention to which has produced a condition of stand- d mediocrity in so much of the building ess.

W. GUY FIRBANK
Mortgage Banker
Baltimore, Md.

(Continued on page 80)

for quality-cautious

. . . ENGINEERS

Mesker quality control experts are constantly testing for strength, twisting welds, pounding on weathering bars, or ripping out rivets to see how strong Mesker Steel Sash really are. Their punishment far exceeds any a window receives during shipment, installation or in use, but it assures you of a window that lasts. Heavy anchor fittings make rigid window walls, extra sturdy hardware keeps working for years, and super strength (up to 33% more) makes Mesker quality outstanding.

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LETTERS

LE DUC ON ARCHITECTURE

Sirs:

Concerning architecture: Since you say (*Letters*, May '51, p. 90), "We don't know," in answer to the question, "can the working of principles behind effects, within the same spacial and temporal environment, produce entirely different effects?" I will attempt to answer via E. Viollet Le Duc in the hope that it may help the younger generation of fine architects. "Since the nature of man is one, there is an identity between all the products of his intellect when the latter allows itself to be guided by truth—an identity such that certain forms of art always reproduce themselves under the artist's hand; and that the reason of their thus reappearing is that they are true; for it is the characteristic of truth to reach similar consequences by very different paths . . ." In the cause of architecture.

JOHN LLOYD WRIGHT, *Architect*
Del Mar, Calif.

LACK OF TASTE

Sirs:

Thank you for sending me the insert for "The Next Fifty Years," and I would like to make comment, particularly about the integration of painting and sculpture with architecture.

Many of your architects in this forum express a marked dislike for either painting or sculpture, one writing that "neither painting nor sculpture have a very important place in our life today." This is so categorical an expression of lack of taste that it points the defects of many of our modern architects in their shyness and unwillingness to consult modern creative artists.

I would say, from my own experience, that very very few modern architects have gone beyond complete ignorance of what is going on in painting and sculpture. This lack of intelligent interest in other arts is evident in their own work; slavish copying of the ideas of Mies, Breuer, Gropius and Wright. Suppose all painting today had stopped with the fine Cubist inventions of Picasso and Braque! that would be your parallel in architecture.

If architects had a broader culture, if they were alert enough to keep posted on important developments in other arts, there wouldn't be so much belly-aching about the lack of taste in the public. You must have sufficient background yourself to lead the public—in other words you have to be smarter than the dog.

SAMUEL M. KOOTZ
Samuel M. Kootz Gallery
New York, N. Y.

Most architects object to some modern painting and sculpture because its practitioners do not seem to know the difference between an easel painting, a mural, or understand problems of scale. Some architects may be out of touch with other arts but painters and sculptors have yet to prove they understand architecture. How about throwing a party, Mr. Kootz?

—ED.

(Continued on page 81)

LLEN'S NEW MAGAZINE

irs:

I have an important question to ask; viz. (I ave always wanted to use the expression "viz." a sentence but now that I have done so, I annot say that I feel any the better for it, and doubt the same disappointment will occur hen I get around to using the word "ergo") asmuch as the FORUM has now become forum HE MAGAZINE OF BUILDING would any of you eople start lawing me if I was to start a maga- ne called BUILDING THE MAGAZINE OF FORUMS? Rather than get in any hassle with you over is matter I will compromise and call the maga- ne *Seminar* and *Somearenot*. This is clever but t very. I will deal exhaustedly with the sub- ct of seminars I have attended. Their name legion, but they have no fife and drum corps. Grand Rapids the American Legion has a ncan Phyfe and Drum corps. No relation.

Few men have laid more earphone batteries on altar of their country's good than I have in ending seminars. I have seminared in New rk and Philadelphia and Buffalo and Cleve- d and Harrisburg (no; not in Harrisburg, ere I just had fun) and Omaha and Des ines.

Some of these seminars I went to of my own e will and some of them out of that innate rtesy that is one of my most charming char- eristics. I do not, at the moment, recall what of my other charming characteristics are, it may come to me later. I look at it this ; I am to be on a program and everyone on the program is kind enough to listen ne, so the least I can do is to get up in the ning at a reasonably early hour—say 10:30 nd listen to them.

rom an elapsed time standpoint, I get the st of it as most of the speakers speak longer I do. This is because I get paid $150 for ing speeches now and it is a well-known that the more money a speaker gets the fer he is. When I get $500 for a speech, ll merely stand up and say "Hi."

would be a pity if all this knowledge of nars died with me, or on me, so I will put in my magazine.

second thought, it might be better to put your magazine. This will keep me from bothered with trivial little details such hat happened to the $8 million you were sed to get up for Friday's payroll and minutia. I can easily get it in the next 12 s and this will be of great benefit to you tely your *Letters* section has had rather rose tone as writers insist on attempting npossible, such as explaining the Controlled ials Plan. Furthermore, it will effect great mies for you as so many people will cancel subscriptions that the savings in paper will come to approximately. Or in that borhood.

ROGER ALLEN, *Architect*
Grand Rapids, Mich.

(Continued on page 84)

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LETTERS

REPORT FROM BRITAIN

Sirs:

Housebuilding Britain is frustrating and di cult. In fact, without the monthly glimpse of yo glossy pages (for which many thanks), we shou all go nuts.

In England each local authority receives yearly allocation of the number of new hous that may be built in its area. They may allow to one private house for owner-occupation to eve five public (subsidized) houses for rent. If th are further "left" than the Government, they c allow less than one to five, or even none at a As there is still quite a number of people w wish to attempt the heart-breaking feat of hou building for their own occupation, the few priva licenses available are allocated to those who c show the greatest need—the number of childr and adults per room, the degree of substanda accommodation at present, etc. This measure need is also compared with the plight of app cants for public housing and has to be at le as great. The maximum area for a new house now 1,500 sq. ft., and the amount allowed to spent must not exceed the average cost per fl for public housing.

The authority can force a sale at field price threatening to use its power to compulsorily quire a site and dispose in turn to an approv developer. The developer then pays the develo ment charge—i.e. the difference between fi value and market value as a building plot—the government. Many people do in fact p double because they object to complaining the local authority in an endeavor to get them get tough with an owner. Local authorities nea always acquire their sites at field value and oft by compulsory acquisition.

The only rationed material at the moment softwood, for which 264 ft. cube is allowed p 1,000 ft. Plywood and hardwood is off ration, l of course is expensive. Non-ferrous metals su as brass, zinc, copper, etc., and galvanizing pr esses to many articles are now prohibited owi to the re-armament program, and the stock components incorporating them is rapidly coming exhausted.

We architects spend most of our time chasi licenses and planning approvals, negotiating velopment charges and Herculean economies, e so that when, and if, at last we hold the perm in our hands we can be excused if we feel th the job is nearly over. In point of fact, howev it takes a further nine or twelve months to do actual building. The reason is lack of discipli lack of free movement of supply and dema How can you discipline a supplier way behi schedule when nobody else can sell you the goo without an even longer delay, even if they can persuaded to accept your order at all? How c you discipline a workman if under the system "full employment" you cannot get anyone e to replace him (and he knows it)?

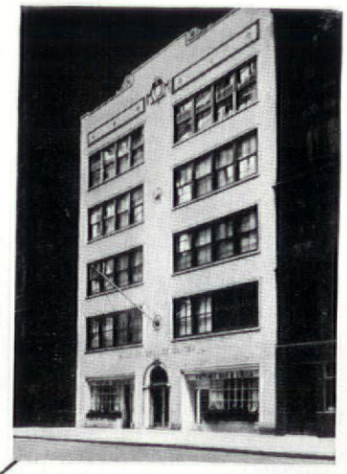
E. WILLIAM PALME
Enfield Middx, Engl

(See other LETTER *Section, page 154)*

People Who Know Choose . . .

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Local 32B, of the Building Service Employees Union, whose membership consists of building maintenance experts, selected Radiant GLASSHEAT as the sole heating system for their modern headquarters building.



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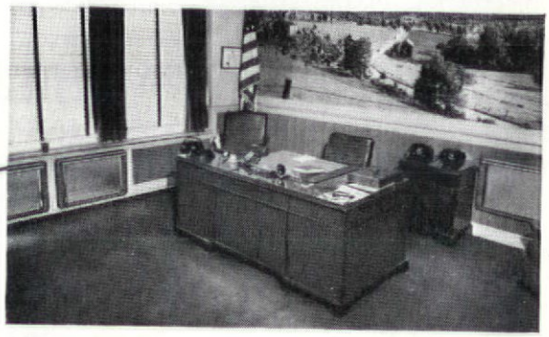
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ROOM-BY-ROOM CONTROL

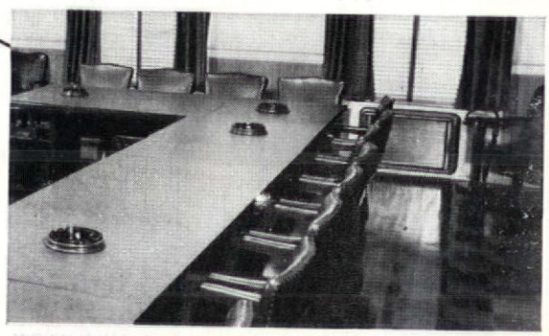
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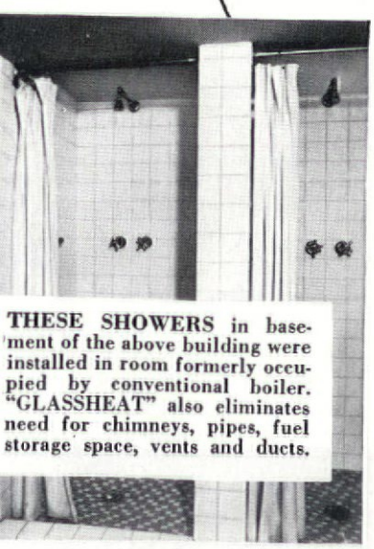
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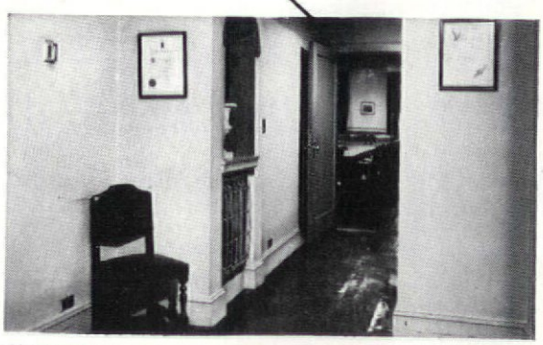
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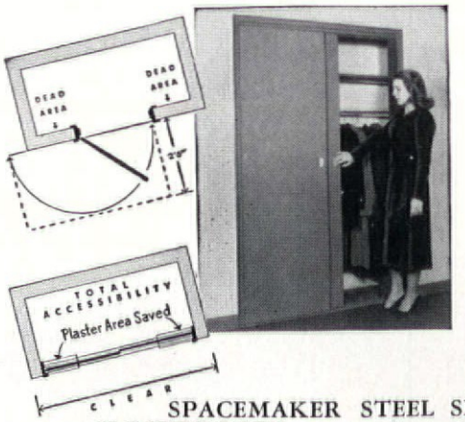
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PARKAY
READY-FINISHED HARDWOOD FOR FLOORS AND WALLS

LETTERS—How to save 30% on stee

(Continued from page 154)

stress at the supports of all members if th joint of opposing beams across the supportin girder and of girder to column to girder is mad 100% fully continuous.

The advent of welding permits the enginee to design members of varying cross sectio which, when properly designed, should resu in frames more economical both in steel ton nage and total cost, of greater structural resis ance than a riveted frame.

MAURICE SASSO, *Consulting Enginee Los Angeles, Calif.*

Similar experience

Our experience in Los Angeles has been ama ingly similar to that of Mr. Saxe in Baltimor The structural fabricators almost refuse t submit a satisfactory proposal on welded worl convincing us that even though weight saving would be effected by welding, there would be n economy in dollars. However, it has alway amazed us how the very small fabricator, wit out benefit of shears or punches, is able to d some small structures at a very satisfactor price per pound. Obviously something is amis in the larger fabricators' thinking. We call the "cut, punch and rivet shops."

For the past year we have endeavored to g the local fabricators through the American I stitute of Steel Construction interested in deve oping sufficient information on the use of highe strength steels. They have continuously evade a true answer to the economic question.

We believe Mr. Saxe hardly goes far enoug when he mentions using 24,000 lb. stresses the steel. We feel that we are very close t the time when 30,000 lb. would be a more sati factory change.

J. EDWARD MARTIN, ALBERT C. MARTI & ASSOCIATES, *Architects & Engineers Los Angeles, Calif.*

I am in complete agreement with Mr. Sax (but) . . . the real savings in steel would b greater by going to reinforced concrete. . . .

MILES F. WORTHAM, *Engine Tellepsen Construction Co. Houston, Tex.*

Mr. Saxe's examples are fair and reasonab and do not exaggerate any principles of desig The percentage savings he indicates are in lin with general experience as far as savings base on pounds of steel are concerned. However, th percentages do not carry any analogy to dolla savings as the labor element is still the ma factor in costs. . . .

In a few years the all-welded structure wi replace the riveted type . . . but it does prese additional problems. . . .

Welding and riveting employ different kin of manpower, although the same man may

(Continued on page 92)

For Efficiency, Economy, Convenience

YOU CAN'T BEAT

Nepcoduct-

THE *Simplified* UNDERFLOOR WIRING SYSTEM



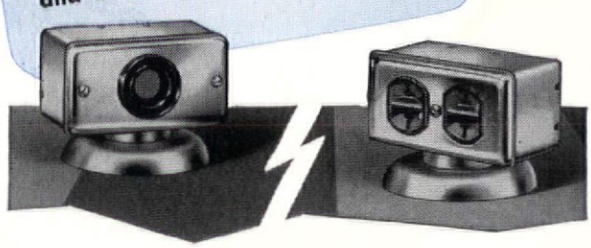
What do you want in *your* underfloor wiring system? *Efficiency?* NEPCODUCT adapts to any type of floor construction . . . provides for all the electrical service you will ever need.

Or maybe you want *economy.* NEPCODUCT is the most economical method for providing wiring facilities for light and power, signal circuits, communication and telephone. Costly cutting of the building structure or routing of concrete is eliminated . . . electrical extensions are needless.

Want *convenience?* NEPCODUCT provides outlets already threaded, *wherever needed,* at the floor surface . . . regardless of office space or furniture arrangement.

What about *simplification?* NEPCODUCT consists of one standard size duct for either high or low potential wiring. Only three combinations needed for *all* your wiring needs. A minimum number of junction boxes and fittings . . . 60% less assembly parts. NEPCODUCT eliminates confused specifications . . . is easy to understand . . . still easier to lay out and maintain.

The NEPCODUCT system also provides smartly modern service fittings designed for added dignity, beauty and easy installation.



Steel for Permanence . . . Grounded for Safety.



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RUSH ORDER *Plants Go Up On Time...*



Ceco open-web steel joists are especially suitable for roofs of one-story defense plants. Their light weight permits speedy installation without special equipment or falsework — also reduces the size of supporting beams, columns and footings. More manufacturing area is made available.

-with Open-Web Steel Joist Construction

There's need for speed in building today—an urgency that has to be met. For the nation's industrial plants must expand so enough of the things vital to defense can be made in quantity—quickly. And to help you complete more plants "on time", open-web steel joist construction truly meets the need. Here is the fastest way ever to build, with a saving in labor, too. No temporary framework is necessary—there's nothing to take down. So since speed is the need on "rush order" plants, specify Ceco open-web steel joists. They are fabricated to exact sizes in the factory, come to the job tagged, ready to install. Ceco assures you fast service from five strategically located plants: Birmingham, Chicago, Houston, and the New York and Pittsburgh areas. When speed's your need—call Ceco. Ask for new steel joist catalog.

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General Offices: 5601 West 26th Street, Chicago 50, Illinois

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In construction products **CECO ENGINEERING** *makes the big difference*

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with Westinghouse MERCURY lighting

A tank company in Illinois ran cost studies on the new Westinghouse Mercury Lighting System. Results:

1. Operating costs are reduced because mercury vapor produces more light per dollar than any other light source.
2. Maintenance costs are cut because it takes fewer fixtures to produce high levels of illumination than with any other lighting system.
3. Lamp replacement costs are lower, because mercury vapor lamp life is 5,000 hours—5 times longer than the most efficient incandescent lamp.

This is one of hundreds of "time-tested" installations. Investigate the Westinghouse Mercury Vapor Line: 400, 1000 and 3000-watt units for low or high-bay areas . . . open or closed fixtures for clean or dirty locations . . . low or high-voltage ballasts for any distribution system.

Send for B-4727, **"Westinghouse Lighting at Work" in every industrial area.** Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pa.



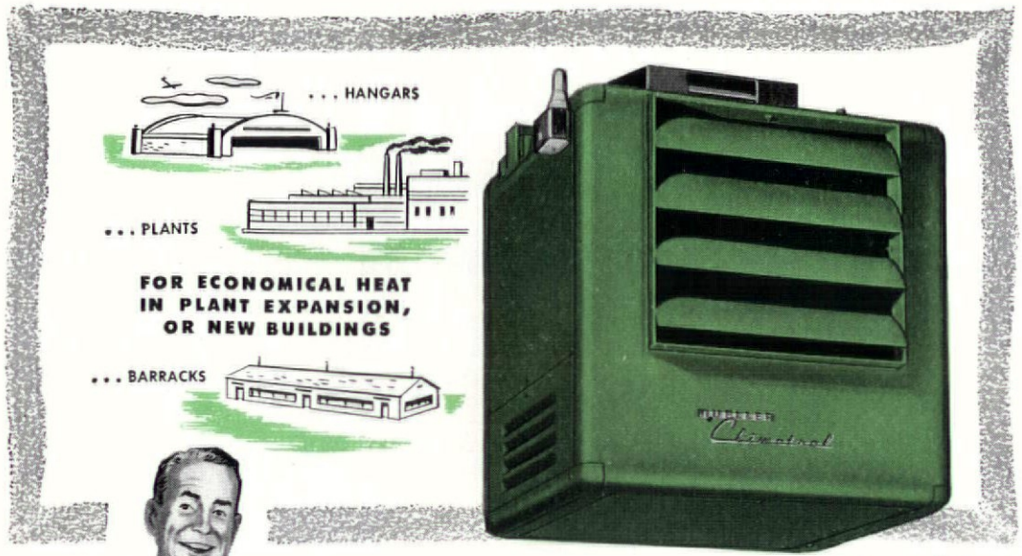
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Westinghouse

LIGHTING DIVISION

Edgewater Park, Cleveland

J-04295



Type 150 Suspended Unit Heater — propeller fan type; 60,000 to 150,000 Btu capacities; shipped assembled and pre-wired. AGA and UL approved.

Mueller Climatrol

GAS-FIRED UNIT HEATERS

— save costs in many ways

For an independent heat source when plant expansion exceeds steam capacity, or for a compact, efficient heating system in new construction where time and costs are vital factors — the Mueller Climatrol unit heater line supplies the perfect answer!

Here are a few of the many savings they offer:

- ✓ *Installation Cost is Low* — shipped pre-wired, completely assembled . . . just hang, connect to gas and power lines and vent. No special chimney needed.
- ✓ *Operating Cost is Low* — efficient horizontal design assures maximum heat extraction, minimum fuel costs.
- ✓ *Maintenance is Easy* — can be completely cleaned and serviced from below without lowering the unit.

When you think of space-heating think of Mueller Climatrol. Capacities to fit any job you have. Write for complete information . . . *L. J. Mueller Furnace Co., 2020J W. Oklahoma Avenue, Milwaukee 15, Wis.*

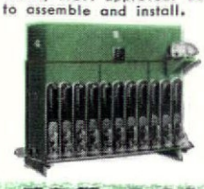
B-56

Capacities and Types for Every Job



Blower Type 151 — Four sizes: 60,000 to 150,000 Btu input; all welded, horizontal design; AGA and UL approved. Shipped assembled and pre-wired.

Floor Type UH — nine sizes: from 180,000 to 540,000 Btu input in 45,000 increments; AGA approved. Easy to assemble and install.



94th Anniversary

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FOR GAS FOR OIL FOR COAL

qualified to do both. Riveting is basically a manual operation, whereas welding requires some knowledge of what is happening, and the quality of the work is dependent entirely upon the operator. The average job foreman has little knowledge of welding and does not intend to be bothered. A weld is a weld, and anything goes. The average welder looks upon a large weld only as a longer job. It is up to the fabricator to persuade labor to learn more about the theory of welds as well as the manual act of striking an arc and running a bead.

To insure qualified welding, the examination and certification of welders is necessary and should be law in every state. The present one-year certification is too long a period and should be reduced to six months. In time these things will be done, but in the meantime the general practice of designing totally welded structures is held back. When the fabricator accepts welding as the new method of construction, the costs will come down, resulting in dollars savings not only in material but also in labor. . . .

Another place where steel savings could be made is the "codes" under which the engineer is limited in his work. Most city building codes keep pretty well up with progress in engineering design, but . . . in the Federal Government this is not the case. Each bureau and department seems to think it must publish a set of codes or specifications to govern those doing design work. Most of these are a conglomerate collection of sections out of old text books and bulletins long since outdated. If all Government agencies would use the same code, i.e., A.I.S.C. and A.W.S. for steel construction, many engineering man hours would be saved and savings in materials would permit much more construction under the same appropriation.

I would not be against using the 30,000 psi if I could pick the fabricator and erector in each case. However, under competitive bidding I would be unwilling at this time to go past 24,000 psi.

JAMES E. HASTAIN, *Consulting Engineer Phoenix, Ariz.*

Savings up to 50%

I liked your May article *How to Save 30% on Steel* and I think it should go further. The current prices of steel certainly justify the highest type of design in any structure.

I also see no reason to take any exception to the 24,000 lbs. sq. in. unit stress in both the positive and negative areas in welded construction, since it is relatively safer in compression in the supported flange areas of the positive moment area than it is in the negative area, as permitted by the AISC code, where the compression flange is only poorly supported against lateral buckling.

It is also quite safe in welded construction as compared to 20,000 lbs. sq. in. in riveted construction with all the heavy concentrations of stress that exist around the rivet holes.

Currently I am preparing designs for a composite steel and concrete joist floor of welded truss construction that will have about 50% better steel economy than Mr. Saxe's design "C," but may not have quite as much improvement in the dollar economy for the reasons stated in his article and the inertia of the steel fabricators in general. However, my new design is being built by the Hawaiian Welding Co. in Honolulu and they like it.

NED L. ASHTON
Professor of Structural Engineering
State University of Iowa

Heavier columns

I have read with great interest your article relative to saving of steel by means of welded design of buildings. The following comments, although critical of the claims made in this article, are offered as constructive thoughts on this very interesting subject. . . .

In a building structure with rigid joints . . . in accordance with the principles of continuity, it will be found that in a good many instances where loading is unbalanced, the stresses in columns, and therefore the column sections, may be more than doubled because of continuity. This factor has been neglected entirely in the article which appeared in your magazine and is of prime importance. . . .

The close tolerances required for field assembly of welded members materially increase the cost of fabrication. Principal members have to be cut to almost exact lengths for welding, whereas with riveted construction differences in length are made up at the time clip angles or other devices are attached either in the shop or in the field. Misfits in the field can be remedied more easily where connecting angles are provided. . . . Construction of a safe welded steel building is contingent upon highly skilled welders and the optimism in regard to saving of steel for defense would be largely offset by sober consideration of the fact that skilled labor is especially scarce due to this same defense effort.

The fact that good welds depend entirely upon the human factor has been the chief deterrent of welded construction. The continuing lack of high skill in welding among the general run of workmen is still a serious obstacle. . . .

The design of a welded structure must be based on the principles of continuity and this design is very similar to that of continuous concrete structures. Many consulting engineers and architects have not become sufficiently familiar with the principles of continuous design to enter into this work. Furthermore, design of continuous structure entails very much more time on the part of the engineer than does a simple steel structure. . . .

We have designed a number of welded structures in the past few years. These were in all cases rigid frames for longspan roof construction. Welding has a very important place in this field

(Continued on page 100)

. . . COMMERCIAL STORES
FOR STEAM or HOT WATER HEAT or HOT WATER SUPPLY!
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Type 20 Gas Boiler — cast iron, sectional; from 315,000 to 3,780,000 Btu input capacities.

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—low cost in every way

No matter how you look at it, the Mueller Climatrol line gives you the best answer to your radiant and radiator heating and hot-water supply jobs. Quality construction, compact design, advanced engineering—all 'round boiler "know-how" — make every Mueller job low-cost from first to last:

- **Initial Costs are Low** — close-to-size capacities give you an economical installation for every job. Factory "assembled" tests make it easy to deliver an efficient installation.
- **Operating Costs are Low**—meticulous engineering of every part plus top-quality material and construction standards assure years of fuel-thrifty economy with minimum service and maintenance.
- **Future Expansion Easy** — sectional cast iron construction makes it easy to add capacity for additional loads simply by adding new section-burner units.

And that is just a brief outline of the many low-cost advantages of Mueller Climatrol boilers. Write for complete details . . . *L. J. Mueller Furnace Company, 2020 W. Oklahoma Avenue, Milwaukee 15, Wisconsin.*

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Capacities from 54,000 to 3,780,000 Btu (including Type 20 above)

Type 10 Gas Boiler — for steam or hot water heating or hot water supply. Nine sizes — 54,000 to 378,000 Btu input.

Type 11 Gas Boiler — Same as the Type 10 shown above except for the outer casing — controls are exposed.

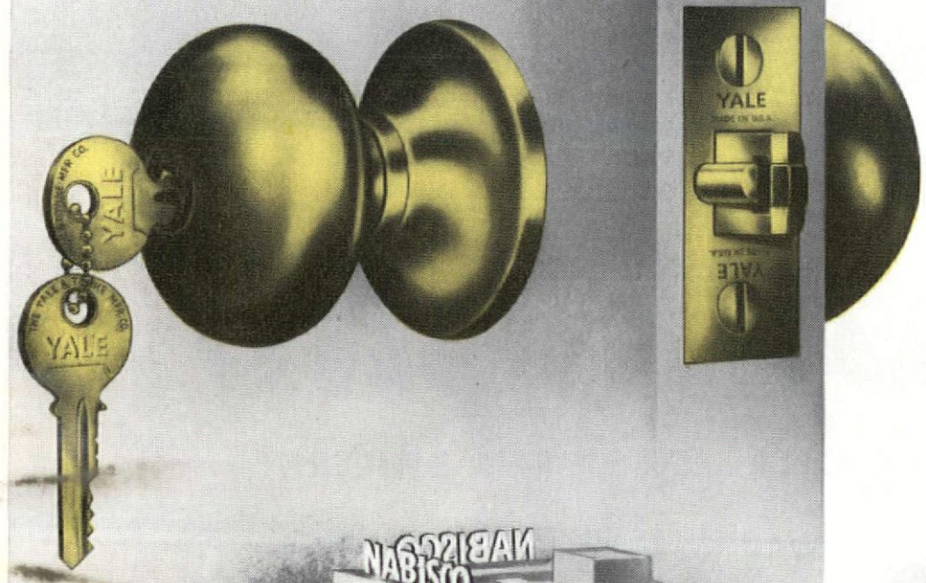
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First choice in industry, too!

Versatility—that's another great advantage of YALE *hardware. You can put* YALE *quality into* any *type of building... commercial, institutional, residential, industrial.*

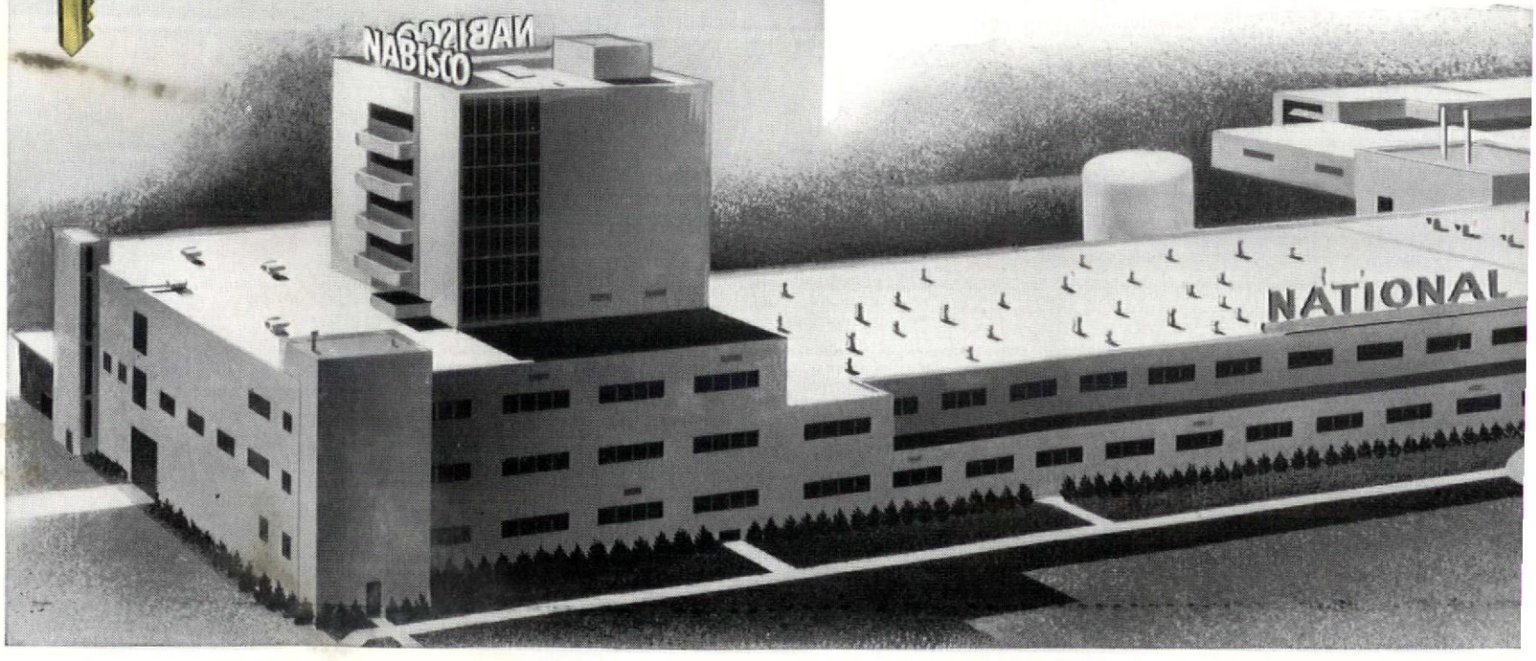
YALE



YALE Compact Door Closer —series 90. This graceful "efficiency expert" makes the Nabisco plant a quieter, better place to work. It's easily installed, inexpensively maintained, takes years of hard usage. In many sizes and models.



YALE Locksets. Master-keyed for entire plant. Shown at left, office door lock with key outside, push-button inside. Six other types for almost any kind of door. Plain or dead-locking bolt. Requires very small mortise. Easy door thickness adjustment.



USE AMERICA'S *Number 1* HARDWARE

PLANT SELECTS HARDWARE

• HERE'S EVIDENCE of the kind of client-satisfaction every architect and builder likes to achieve.

National Biscuit Company—dollar-wise veterans in the food industry—builds another plant, a 10-acre giant in Portland, Oregon.

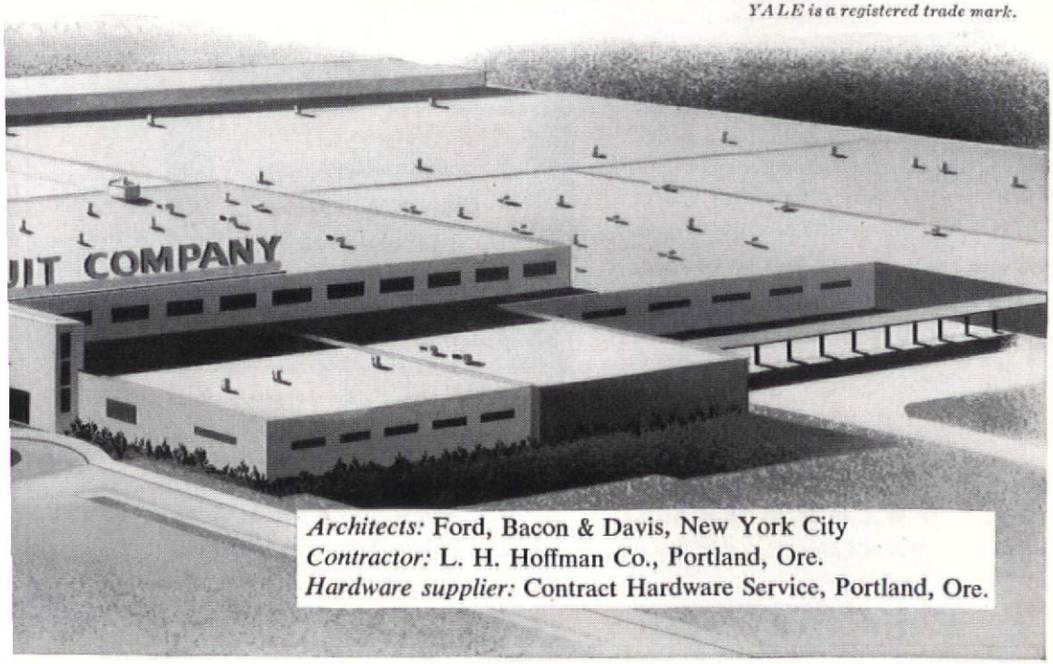
And, as in *three other Nabisco plants*, the choice of hardware is...YALE!

It happens time after time, in buildings of every type—once YALE hardware is in, *it stays in*...and serves so well that any future choice of hardware is practically automatic!

Specify YALE for your next job. Once you've seen how effectively this rugged, ever-attractive hardware maintains security while cutting upkeep costs, you and your client will *know* what we mean. For detailed information, write The Yale & Towne Manufacturing Co., Dept S-68, Stamford, Conn.

YALE & TOWNE

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Architects: Ford, Bacon & Davis, New York City
Contractor: L. H. Hoffman Co., Portland, Ore.
Hardware supplier: Contract Hardware Service, Portland, Ore.



The new Chrysler Building East. Like the famous Chrysler Building (in background) where YALE hardware has been in use for 21 years—this new skyscraper will be equipped throughout with YALE.



The John Hancock Building, beautiful new high-point on the Boston skyline. Excellent taste shows in every detail of the planning here. The hardware—YALE.

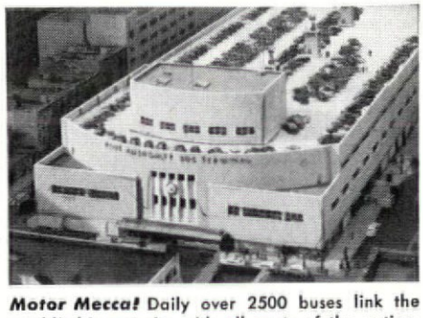


The Farm Mutual Building, Columbus, Ohio. YALE hardware is the choice here, too. In this solid city block of impressive architecture there'll be greater security at lower cost for years to come.

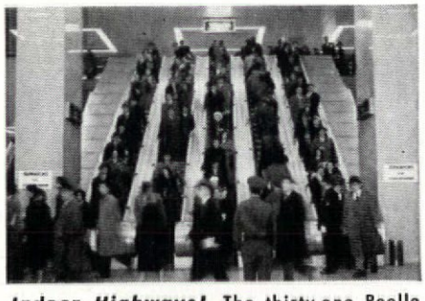


invisible "traffic cop"

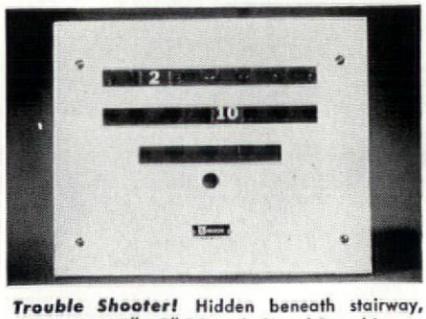
Edwards Signal Boards Guard Smooth, Safe Flow of Traffic through World's Biggest, Busiest Bus Terminal



Motor Mecca! Daily over 2500 buses link the world's biggest city with all parts of the nation. Terminal's roof provides additional parking space for 450 private cars.



Indoor Highways! The thirty-one Peelle Motorstairs protected by Edwards Signal Boards insure the swift, orderly flow of thousands of passengers from one Terminal level to another.



Trouble Shooter! Hidden beneath stairway, this compact 6″ x 7″ Edwards Signal Board is constantly on the alert to spot trouble . . . saves valuable time and labor in maintenance.

Hidden under a plate at the foot of each of the 31 moving stairs that daily carry over 130,000 passengers through the new Port Authority Bus Terminal in New York is an Edwards-engineered signal board. From this board sensitive electrical "fingers" stretch to potential failure points. If trouble occurs on any stairway, these invisible "traffic cops" instantly indicate its source . . . enable the Terminal's engineers to repair it quickly before dangerous congestion can result. This unique installation shows how Edwards equipment safeguards lives and property and insures economies through greater operating efficiency in business and institutions everywhere.

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VINYL PLASTIC COVE BASE TRIM in 8 smart colors!



CB 42 (LIGHT BLUE)

Here's added color charm for your next floor installation. Fremont continuous length Cove Base now comes in permanent colors that never need refinishing,—nothing to chip or peel. Properly adhered on either flat or curved wall surfaces, it gives a low-cost base trim protection from dirt, vermin, water or scuffing. It cleans easily with a damp cloth. For best installation, Fremont Rubber Tile Adhesive is recommended.

Plan your next job with the perfect finish—Fremont Cove Base in color.

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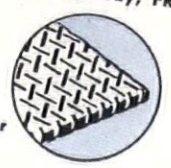
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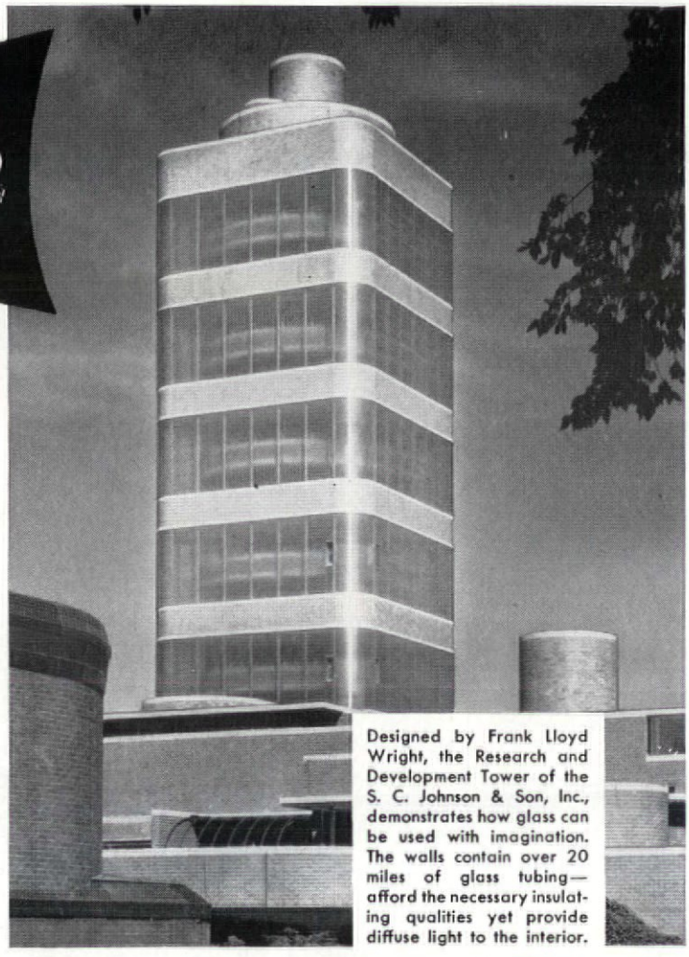
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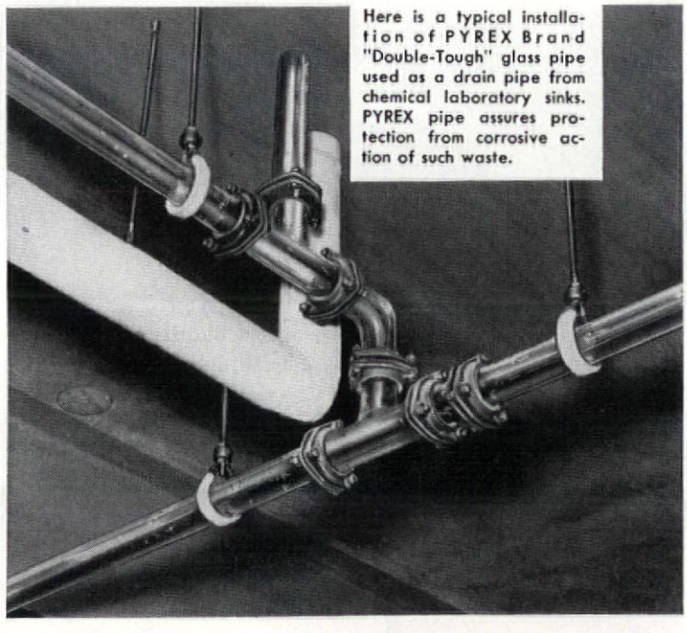
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For structural or decorative use—transparent, sparkling glass tubing offers tremendous scope as a practical medium for structural or decorative applications—is limited in use only by your imagination. For special effects, glass tubing can be obtained in a variety of sizes. Glass does not shrink or deteriorate from exposure to weather—retains its attractive appearance indefinitely. And Corning can supply you with tubing bent to various patterns, if required. Our engineers are ready to give you any assistance or information you might need on the use of glass tubing. Write today and tell us what you have in mind.



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For corrosion-resistant piping—in hospitals, schools or industrial laboratories, PYREX Brand "Double-Tough" glass pipe provides definite advantages for laboratory drain lines, waste acid lines or permanent distilled water lines. It is resistant to all acids except hydrofluoric. Its chemical stability provides protection against contamination of distilled water and its heat resistance permits sterilization in place, if necessary. Easily installed and maintained, its transparency permits quick visual inspection. New "Double-Tough" strength assures long life. You should have Corning's new Pipe Catalog for your files. Write for it today.



Here is a typical installation of PYREX Brand "Double-Tough" glass pipe used as a drain pipe from chemical laboratory sinks. PYREX pipe assures protection from corrosive action of such waste.

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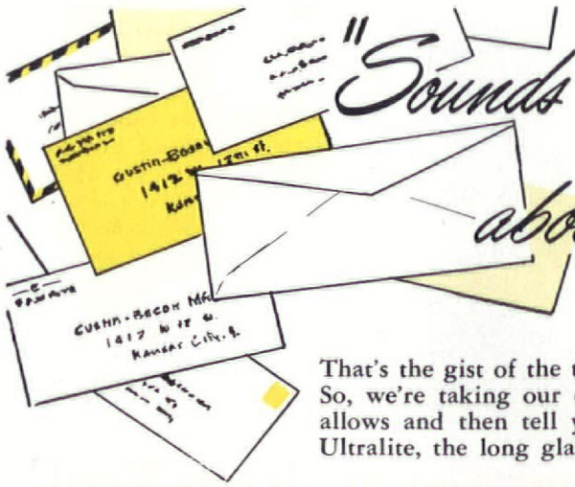
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Ultralite consists of long, strong, drawn glass fibers, bonded with a thermo-setting plastic resin. It is manufactured in continuous blanket rolls that are semi-rigid, yet resilient. These blankets have all the inherent characteristics of glass itself, except that they are soft, light and flexible. Ultralite is available in thicknesses from ½" to 6" and in ¾, 1, 1½, 2 and 3 lbs. per cu. ft. densities. Roll widths range from 18" to 120"; roll lengths vary, depending on thickness. Ultralite is also available in cut-to-size pieces.

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Product	Density	"K" Value at 60° Mean Temp.
Ultralite "75"	¾ lb. per cu. ft.	.253
Ultralite "100"	1 lb. per cu. ft.	.246
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Ultralite "200"	2 lb. per cu. ft.	.233
Ultralite "300"	3 lb. per cu. ft.	.217

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Your applied cost is less; profit greater. One reason: Ultralite is 100% usable — no loss due to breaking, chipping, flaking or denting. Another reason: Ultralite goes on faster and cheaper. You can cut it with a knife, run it around curves, corners, valves and fittings. You can fasten it in place with adhesives, screws and washers, wires — even staples. Compressibility and resilience make it easy to use in "tight spots".

Ultralite is available plain or with your choice of 7 attractive facings (some vapor barriers) already adhered to insulation. Comes cartoned in compressed rolls that are easy to store. Extremely lightweight, easy to carry, pleasant to handle. Available in various weights and thicknesses, for all types of heating, piping, air conditioning applications and for metal buildings.

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when you fish . . . If you were this fisherman, you'd probably never use a small black gnat if trout were feeding on a fresh hatch of green May flies.

or when you write wiring specifications. Neither would you specify a wiring system without careful consideration of its suitability. Instead, you'd make sure that *your* specifications matched up accurately with all the job requirements.

That's exactly why 3-way cooperation between you, your electrical contractor, and Graybar is often the first step toward practical solutions to plant wiring problems. So, make it a point on your next job to take full advantage of the services and facilities available through your local Graybar office.

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2. Complete catalog service covering more than 100,000 Graybar-distributed electrical items.

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Graybar Building, 420 Lexington Avenue, New York 17, N.Y.

LETTERS—How to save 30% on steel

at the present time, but it is doubtful whether general use of welding for building structures can become popular until some of the unfavorable factors mentioned have been overcome.

QUENTIN H. BOWERS, *Engineer*
Lacy, Atherton & Davis
Wilkes-Barre, Pa.

Facts right, costs wrong

The facts are correct but the recommendations would increase the cost of buildings and require a longer time to erect them. . . .

CARL METZ, *Engineer*
Shaw, Metz & Dolio
Chicago, Ill.

Why only 24,000 lbs.

We have long wondered why steel cannot be stressed higher than even 24,000 psi. The unit tensile strength is over 60,000 psi.

Deflection is the only limiting factor (other than a reasonable margin of safety) in designing right up to the yield point of the steel.

Airplanes are designed that way, and buildings could be too, if floor loads were limited to design loads.

In our portion of the country it costs more to erect steel by welding than by riveting.

W. B. MACWHIRTER, *Consulting Engineer*
Grand Rapids, Mich.

Plug for lightweight aggregates

Sirs:

I compliment you on the May article *How to Save 30% on Steel. . . .*

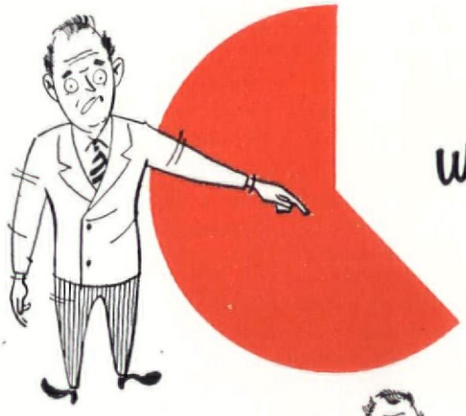
While this latter article refers to steel savings through the combination of higher allowable stresses, field welding and rigid frame design, I would like to add a very important method of saving steel which can potentially save even greater quantities than these methods. That method is the use of lightweight aggregates which make possible the design of lightweight structures.

These aggregates go into concrete for lightweight floor fills, roof fills and curtain walls; into plaster for fireproofing structural steel without the need of heavy imbedding concrete; and into base coat plaster for interior walls and ceilings. Lightweight aggregates can account for savings of as much as 80% in the "dead load" of a building. The greatest proportion of this dead load saving is in structural steel.

The development of lightweight building design is no temporary expediency. It is a sound concept of construction made possible by improved building technology and the development of lightweight aggregates.

With the present military requirements for steel, it is essential to take the fullest possible advantage of this modern, proved construction method.

DONALD H. GOTT
General Sales Manager
Great Lakes Carbon Corp.
New York, N. Y.



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assure a full 100% life for fluorescent tubes!

Tests show that fluorescent lamps last longer when used with a CERTIFIED BALLAST than when connected with an improperly designed ballast.

CERTIFIED BALLASTS assure rated light output, quiet operation and long, satisfactory service. There's a reason for this. It is... CERTIFIED BALLASTS are made to precise specifications, then tested, checked and *certified* by Electrical Testing Laboratories, Inc.

● Complete information on the types of CERTIFIED BALLASTS available from each participating manufacturer may be obtained from Electrical Testing Laboratories, Inc., East End Avenue at 79th Street, New York, New York.

Participation in the CERTIFIED BALLAST program is open to any manufacturer who complies with the requirements of CERTIFIED BALLAST MANUFACTURERS.



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Plants: Jersey City, N. J. Dover, N. J.

BEHIND THE BLUEPRINTS



Forty-three year old Architect **CHARLES HOWSON ABBE** is a Harvard alumnus, trained during the depths of the depression at N. Y. U.'s School of Architecture. He has worked for several famous modernists, including George Howe, Stonorov and Kahn, William Lescaze, and, since 1946, Harrison & Abramovitz, for whom he handled the design of the dramatic new Corning Glass Center (p. 125).



San Francisco Architect **MILTON PFLUEGER** fell heir to his brother Timothy's extensive practice on the latter's death in 1946. Milton got his start in the office of Bakewell & Brown, came to work for his brother in 1930. Sixteen years later he carried on for him, adding an ever-increasing volume of schools, hospitals, and commercial buildings to the office portfolio. Recently completed is the Richmond Civic Center (p. 138). Pflueger has also added three associates to the firm: Leffler Miller, Joseph Scoma and Scofield DeLong.



Seattle-born school specialist **JOHN LYON REID** is a graduate and former professor (for eight years) of MIT's School of Architecture. He worked for Ernest J. Kump for 6½ years, designing schools, was in partnership with Sidney J. Bamberger until the latter's untimely death in 1948. Reid is 44, has his own San Francisco office with three associates: Burton Rockwell, William Howard Edie and Richard S. Bamwell. Recent fine example of Reid's school technique: the Sir Frances Drake Elementary School in the Bay Area's Lake Merced district (p. 132).



ELI LURIA



GERALD LURIA



N. SATTERLEE



F. LETHBRIDGE

Brothers Eli and Gerald Luria joined forces with Nicholas Satterlee and Francis D. Lethbridge to design and build one of Washington's contemporary subdivisions (p. 162). The youthful Luria's (34 and 35, respectively) are second generation builders with 250 homes to their credit in five postwar years of housebuilding. Nicholas Satterlee (35) is a Harvard architect. Francis Lethbridge (31) is a product of the University of Colorado's School of Mechanical Engineering and Yale Architectural School. He and Satterlee were practicing together when they designed the Luria's Holmes Run development, are now principals of the firm of Keyes, Smith, Satterlee & Lethbridge.



LLOYD WRIGHT, eldest son of Frank Lloyd Wright, shares his father's passion for developing new combinations of forms and materials. A practising Los Angeles architect for 29 years, he designed the Hollywood Bowl shell and many West Coast residences. His latest imaginative excursion is a crystalline Wayfarer's Chapel overlooking the Pacific at Palos Verdes. (p. 153)

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MA·TI·CO TILE FLOORING

Why leading architects specify

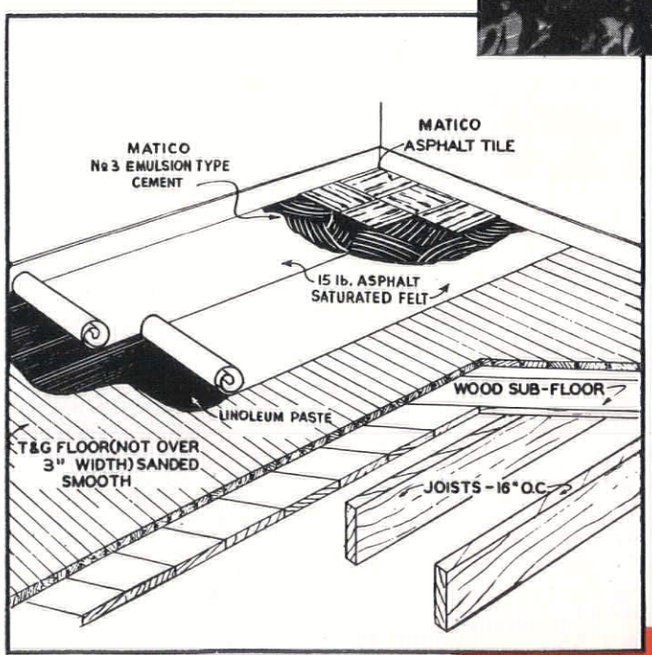
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MATICO Performance Proved in Such Installations Across the Country. Because of MATICO's outstanding advantages of economy, durability, beauty and ease of cleaning, more and more architects, builders and homeowners select MATICO for beautifying and modernizing structures of every type. Recognized for years as the preferred type of flooring for use over concrete subfloors on, above and below grade, MATICO is also used extensively over suspended double wood floors with excellent results. Available in 27 lovely colors, including new pastel "Petal Tones", MATICO harmonizes readily with all decorative schemes, styles and types of architecture. When next you specify asphalt tile remember . . .

MATICO—the modern flooring—is ideal for every type of installation.



PROPER INSTALLATION ASSURES YEARS OF TROUBLE-FREE SERVICE!

Below are instructions for installing MATICO over double wood floors. For answers to questions not covered here, call your nearest MATICO distributor or write to us.

Temperature of the room and subfloors shall be maintained at a minimum of 72° F. for several days before and after the application of MATICO Asphalt Tile. The temperature of the tile itself should be at least 72° and preferably 80°. Under no circumstances should materials be applied which are colder than room temperature.

PREPARATION—Wood subfloors shall be of double construction. The surface flooring shall be of T & G flooring, not over 3" face width, top-nailed and toenailed, sanded to a uniform smoothness, and containing no cupped or springy boards. A 15-pound saturated felt shall be cemented to the wood floor with linoleum paste. Matico #3 Emulsion Type Cement shall be spread over the felt. On top of this the tile is laid.

GET TO KNOW MATICO See our insert in Sweet's Architectural File, section 13g/MAS. For free samples, write us on your business stationery.

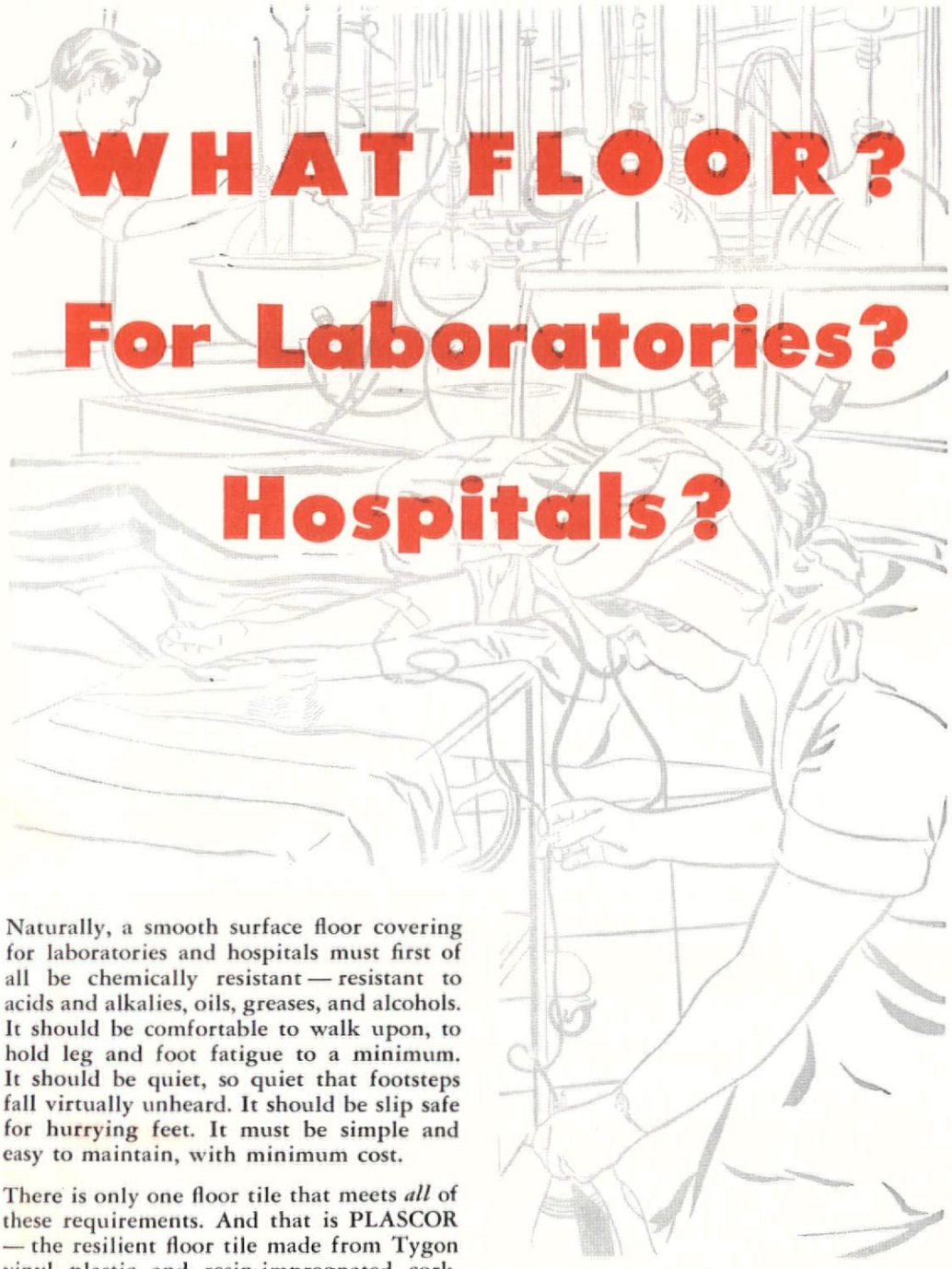
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WHAT FLOOR? For Laboratories? Hospitals?

Naturally, a smooth surface floor covering for laboratories and hospitals must first of all be chemically resistant — resistant to acids and alkalies, oils, greases, and alcohols. It should be comfortable to walk upon, to hold leg and foot fatigue to a minimum. It should be quiet, so quiet that footsteps fall virtually unheard. It should be slip safe for hurrying feet. It must be simple and easy to maintain, with minimum cost.

There is only one floor tile that meets *all* of these requirements. And that is PLASCOR — the resilient floor tile made from Tygon vinyl plastic and resin-impregnated cork. Plascor is a blend of the two materials; molded under heat and pressure into tiles ⅛" thick, and in 8½", 11", 17" and 34" squares.

The Tygon plastic gives this unique flooring exceptional chemical resistance; unusual toughness and long life. The cork content provides unmatched quietness and underfoot comfort. Blended, the two form a tile that is genuinely resilient, safe and pleasant to walk upon . . . a tile that refuses to show "wear pattern" or indentation marks.

Plascor is dense, non-porous. It resists ground-in or imbedded dirt. Its eleven attractive marbleized colors were scientifically selected to minimize dirt visibility. Plascor cleans beautifully. There are no maintenance "don'ts" to worry about. Harsh alkaline cleaners or oily cleaning compounds leave Plascor unruffled.

If you have on your boards a project calling for a floor resistant to chemicals and greases, quiet and comfortable to walk upon, unusually durable, yet strikingly beautiful to look at — specify PLASCOR.

May we send you samples and full technical data? Write Flooring Division, The U. S. Stoneware Co., Akron 9, Ohio.

PLASCOR

the chemically-resistant Tygon vinyl plastic Floor Tile

1416

TECHNICAL LITERATURE

HEATING AND AIR CONDITIONING. Heating, Ventilating and Air Conditioning Guide, 1951 edition. The American Society of Heating and Ventilating Engineers, 51 Madison Ave., New York 10, N. Y., 1448 pp. 6 x 8". $7.50.

An indispensable volume for the air conditioning engineer, this fat compendium on all that blows (or radiates) hot and cold should be a valuable reference for many in the building industry. Its technical text, elaborately cross indexed, is grouped under such headings as fundamentals, human reaction, heating and cooling loads, combustion and consumption of fuels, systems and equipment, and instruments and codes. The symbols presented for use in preparing plans on air conditioning, heating and cooling systems have been updated to conform with those adopted by the American Standards Assn. About one quarter of the Guide is devoted to details on the heating, ventilating and air conditioning products of prominent manufacturers, and information on their application in the design of systems.

Among the myriad worthwhile features in this edition (the 29th) are: a new ASHVE psychrometric chart, a simplified method of designing panel heating systems, and recent data on determining cooling load costs by heat gain through glass and glass block.

LIGHTING. Lighting at Work, Booklet B-4727. Westinghouse Electric Corp., Box 2099, Pittsburgh 30, Pa. 16 pp. 8½ x 11".

This booklet stresses three ways in which good lighting works for the industrial plant operator: it cuts cost by making increased production possible; it increases efficiency by assuring accuracy; and it reduces accidents by posing dangerous operations clearly. Emphasizing that different jobs in a plant call for varying amounts and types of light, the publication analyzes the three light sources in current usage—fluorescent, mercury vapor and incandescent—as to type of light, efficiency, lamp life, maintenance, mounting height, and special uses. Illustrations of various luminaires of each type of lighting are presented along with wattage and lumen output ratings. Fixtures for special areas are illustrated, such as dust and vapor tight units for service in corrosive atmospheres, and luminaires that direct light into bins and stockrooms.

BUILDING MATERIALS. The Story of Kaylo. Kaylo Div., Owens-Illinois Glass Co., Toledo 1, Ohio. 20 pp. 5½ x 8½".

Tracing the development of Kaylo (calcium silicate) products, the brochure describes this material's physical properties—low thermal conductivity, incombustibility, dimensional stability, light weight, etc.—which make it a useful building material. Among the construction applications of this lime, sand, and asbestos compound pictured in the booklet are insulating roof tile, pipe insulation, and firedoor and building panel cores.

(Continued on page 106)





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add Greatly to House Values-

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Everyone knows the sales magic of "Mahogany". The very *word* means extra luxury, extra quality, extra value. . . .

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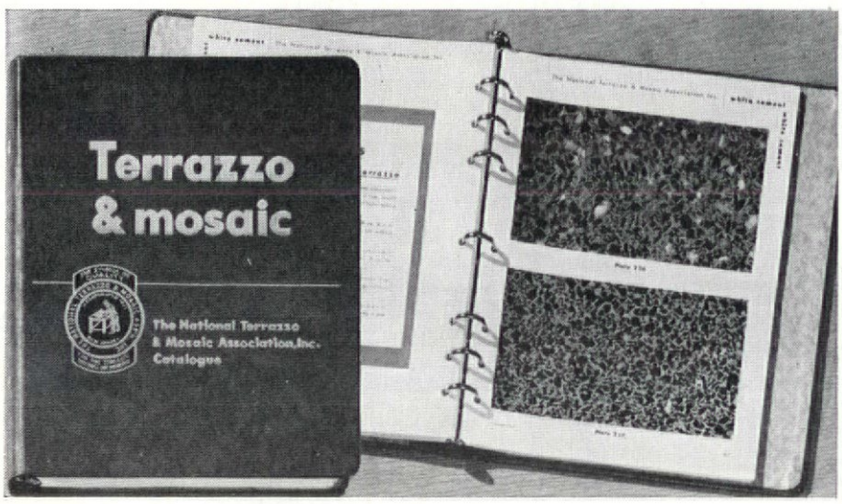
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TERRAZZO AND MOSAIC. Terrazzo. National Terrazzo & Mosaic Assn., Inc., Washington, D. C. 136 pp. 9½ x 11". $10.

As part of their educational and promotional program to disseminate information on terrazzo and mosaic products and uphold good workmanship, the National Terrazzo & Mosaic Assn. is making this excellent volume available to the building industry at printing cost. It is an impressive sales point. Large accurate color plates of terrazzo samples make up the major portion of the book. These are divided into two groups: patterns with gray Portland cement base and those with white cement. The quality of the text matches that of the illustrative material. In one section, fundamental geometric designs are explained from which more elaborate mosaics may be devised. Of special interest to the architect are the chapters on applications of terrazzo to walls, stairs, and various types of supporting floors. There is also data on nonslip floors, treads, aggregates and inserts; explosion hazards of nonstatic floors; outdoor terrazzo and radiant heating under terrazzo; terrazzo for skating rinks; precast terrazzo and art marble; and maintenance and cleaning.



NEW *Terrazzo* CATALOGUE NOW AVAILABLE

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NOW YOU CAN HELP your clients visualize the enduring beauty of TERRAZZO. Handsome new 136-page loose-leaf *Catalogue and Design Book* shows color plates of many of the infinite combinations of color and patterns available in marble-hard, concrete-durable TERRAZZO; provides illustrations of typical installations; offers architectural data on tested methods of installation and maintenance; presents in one compact, easy-to-file volume a wealth of material you'll want to keep at your finger-tips. Order your copy at once—directly from the Association, or from your local Association member. Price: $10.

THE NATIONAL TERRAZZO AND MOSAIC ASSOCIATION, INC.

711 14th Street, N.W. Dept. B Washington 5, D. C.

ROOFS. Ruberoid Built-Up Roof Selector. The Ruberoid Co., 500 Fifth Ave., New York 18, N. Y. 2 pp. 5¾ x 9".

To assist architects and contractors in determining specifications for various types of built-up roofing, the manufacturer has devised this handy selector chart. Convenient in size and easy to use, the selector was prepared for use with the *Ruberoid 1950 Specification Book*, a certificate of merit winner in the product literature competition sponsored by the American Institute of Architects and the Producers' Council. On one side of the chart three basic factors governing the roofing job are noted: slope of deck, type of roof, and whether insulation is to be used. When the pointer is set to these conditions, a reference to the correct set of specifications in the book appears automatically, thus cutting much of the time spent leafing through the catalogue. On the other side of the selector are detail drawings which illustrate proper methods for dealing with problems of flush or open eaves, and low parapets.

FLOORING. Over the Rough Spots. Stonhard Co., 525 Stonhard Bldg., 1306 Spring Garden St., Philadelphia, Pa. 32 pp. 5¼ x 6¼".

This pocket-size brochure tells where to look for and how to correct bad floor conditions with the manufacturers' products. It also presents methods for protecting and maintaining concrete and wood flooring.

HARDWARE. Flush Latches and Hinges. Hartwell Co., 9035 Venice Blvd., Los Angeles 34, Calif. 56 pp. 8½ x 11".

Pictured in this catalogue is the manufacturer's complete line of flush latches and hinges. The latches are described as being easy to operate and to have positive action for dependable fastening. A set of 34 well drawn specification sheets reveal the mechanical details of the hardware.

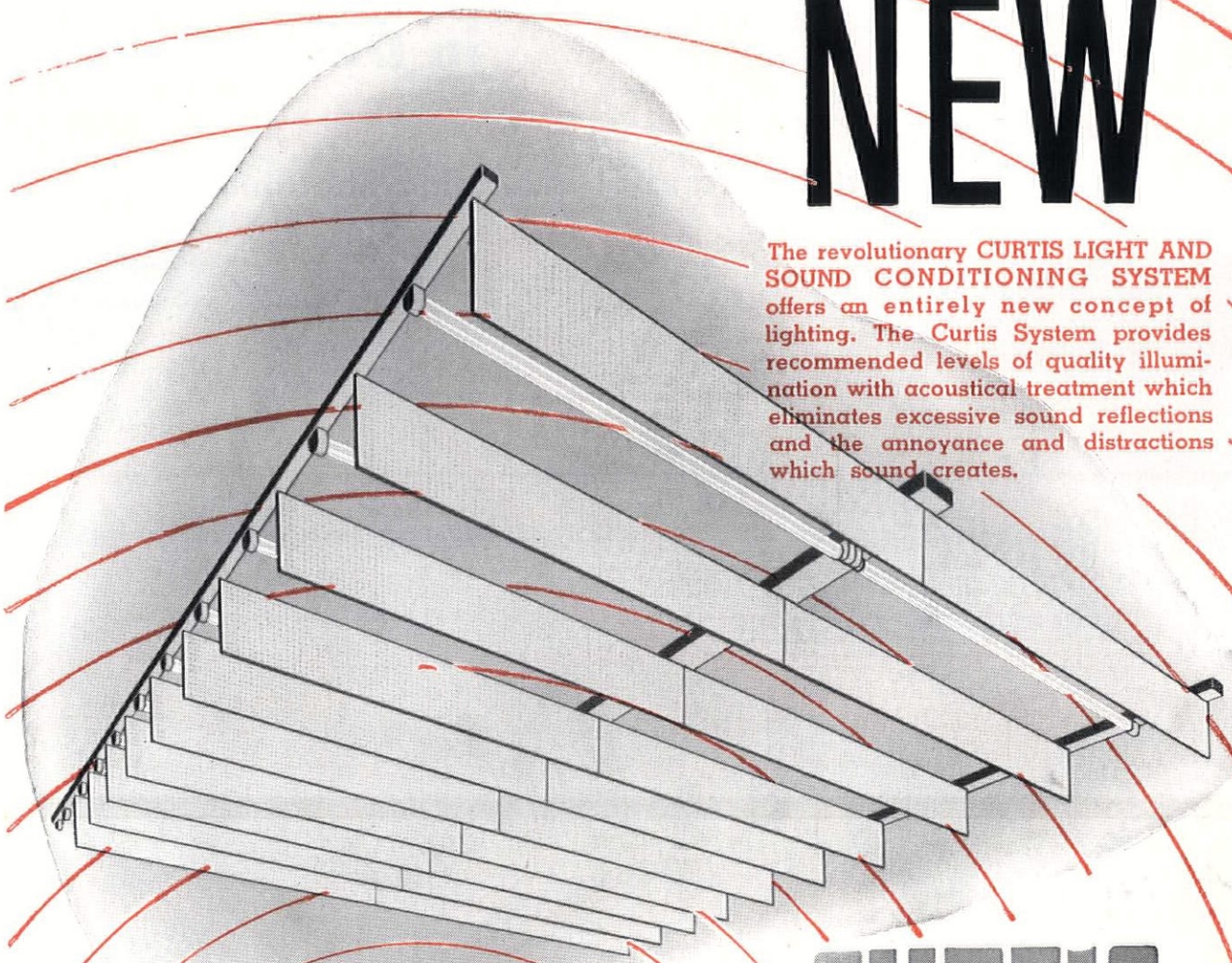
AIR CONDITIONING. Air Conditioning Equipment. Catalogue SA-6692. Westinghouse Electric Corp., Sturtevant Div., 200 Readville St., Hyde Park, Boston 36, Mass. 16 pp. 8½ x 11".

Various kinds of equipment needed to do an air handling or air conditioning job—cleaning, filtering, cooling, heating, dehumidifying, circulating or ventilating—are described briefly in this catalogue. Some of the products covered are hermetically sealed compressors, condensers, water coolers, unit air conditioners, and fans.

(Continued on page 110)

NEW

The revolutionary CURTIS LIGHT AND SOUND CONDITIONING SYSTEM offers an entirely new concept of lighting. The Curtis System provides recommended levels of quality illumination with acoustical treatment which eliminates excessive sound reflections and the annoyance and distractions which sound creates.





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Refer to Sweet's File, Architectural Section—10a/In

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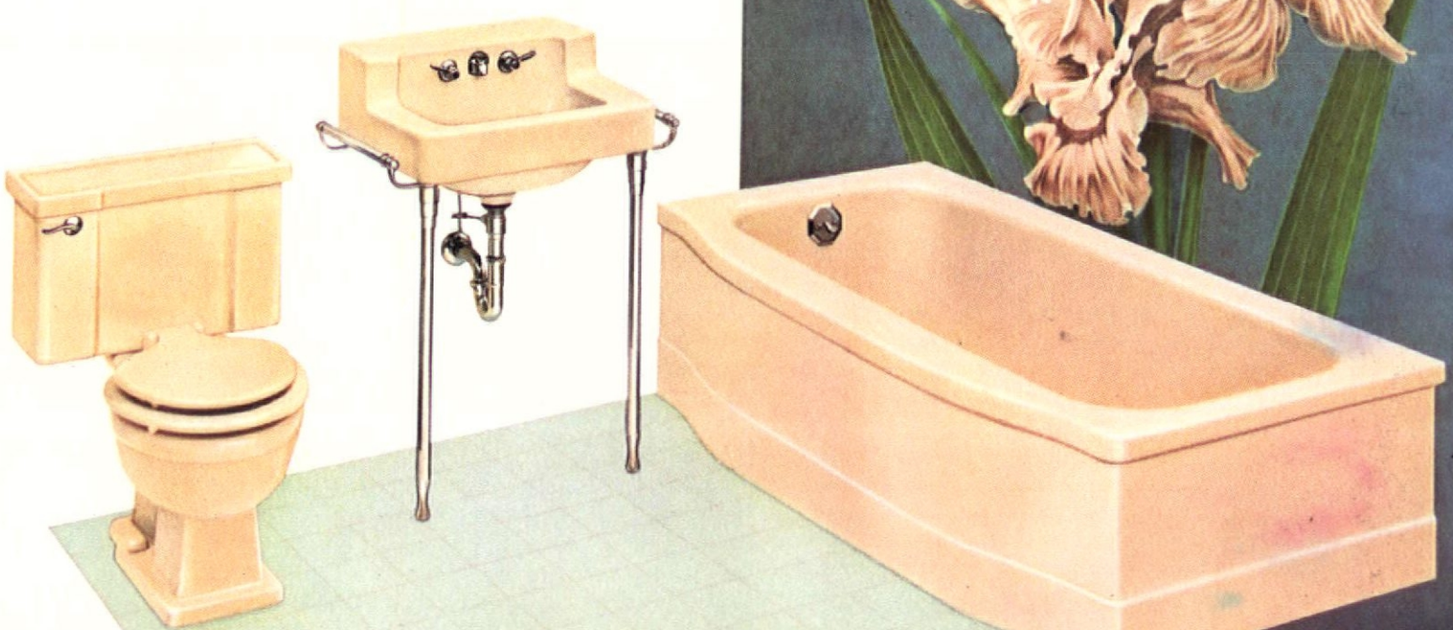
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The square tile-like units come in a wide range of marbleized colors. See the J-M Approved Flooring Contractor in your area. He is listed in the classified phone book. Or write for our free brochure on Flooring. Johns-Manville, Box 158, New York 16, N. Y.



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TECHNICAL LITERATURE

ELEVATORS. The Modern Hospital and its Elevator Needs. Otis Elevator Co., 260 11th Ave., New York 1, N. Y. 20 pp. 8½ x 11".

Compiled to help architects, engineers and administrative officials plan vertical transportation for hospital buildings, the two color booklet illustrates and outlines elevator installations in 24 hospitals. It covers problems of hospital elevator service, automatic controls, elevator entrances, freight elevators and dumb-waiters. Because elevator needs differ in each hospital, the equipment is explained in reference to specific installations, illustrated with photos and charts. Included in the publication are such subjects as handling traffic peaks, special requirements of small and medium sized hospitals, emergency service, and cleaning and maintenance.

HARDWARE. Door Butts & Hinges. National Contract Hardware Assn., 420 Madison Ave., New York 17, N. Y. 24 pp. 8½ x 11". $1.

Published as part of an educational program to provide architects, specification writers and others in the building trade with technical information on hardware products, this book is a thorough study of the many types of hinges on the market for ordinary full-size doors. The first four chapters deal with butt hinges, and furnish data on hinge construction, application, recommended installation, and proper selection. The remainder of the book is devoted to other kinds of hinges such as loose joint friction, tee, H. and H-L, concealed, and pivot.

CLAY PIPE. Robinson Clay Products. The Robinson Clay Product Co., Akron 9, Ohio. 4 pp. 8½ x 11".

Printed in two colors, this new bulletin describes and illustrates the manufacturer's clay building products. Condensed specifications are provided for vitrified and perforated clay pipe, clay liner plates, flue lining, chimney tops and bases, wall coping, and septic tanks.

ELECTRICAL EQUIPMENT. Sales Features for Electricial Living Homes, Booklet B-4691. Westinghouse Electric Corp., Box 2099, Pittsburgh 30, Pa. 32 pp. 8½ x 11".

Adequate wiring, planned lighting, and electrical appliances have proved to be home builders' big selling points. This booklet describes several "electrical packages" suitable for various size, type and price of homes. Photographs, floor plans, layout sketches and wiring details illustrate the houses designed and constructed by the manufacturer's Better Homes Bureau, working in collaboration with electric utility companies, architects and builders. Electrical equipment and good lighting are features stressed for the scientifically planned kitchen. Warmth and proper illumination are noted as appealing sales factors for bathrooms. Also described are decoratively effective lighting schemes, such as cornice, pin hole spot, valance and cove lighting.

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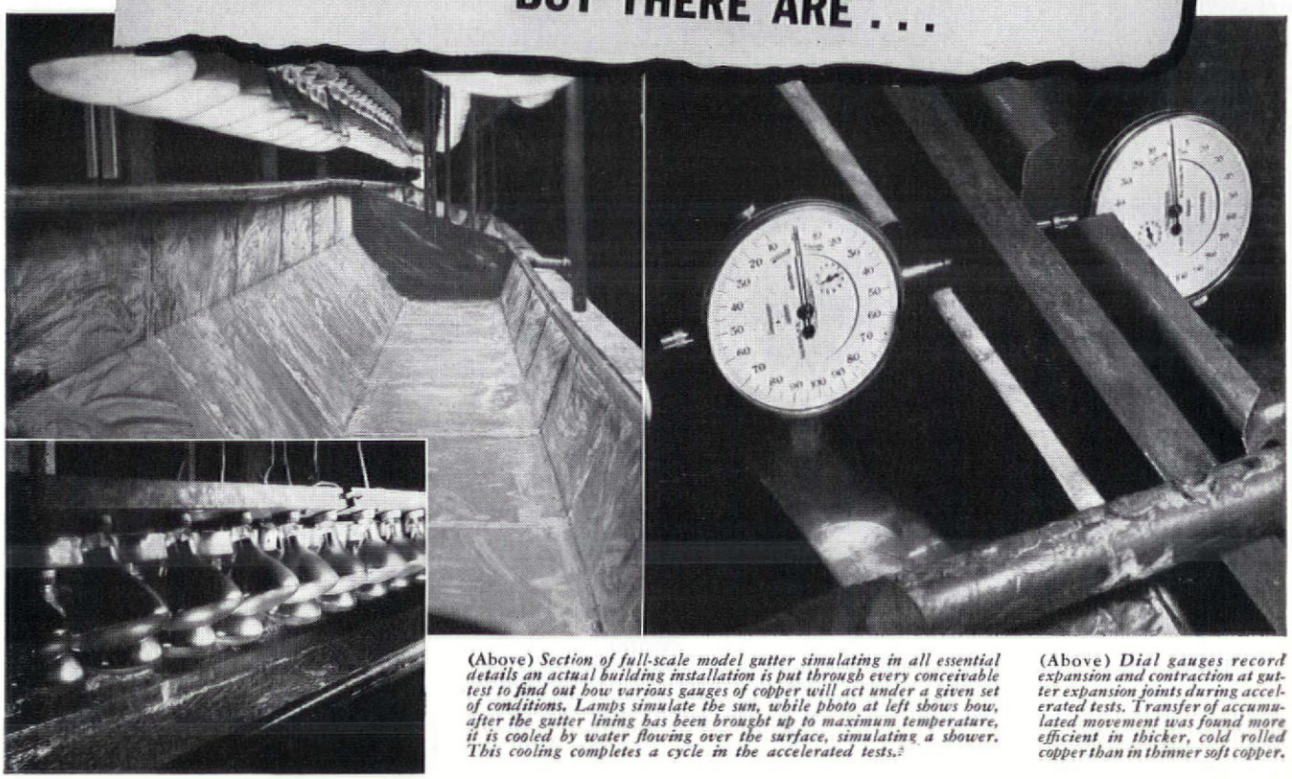
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(Above) *Dial gauges record expansion and contraction at gutter expansion joints during accelerated tests. Transfer of accumulated movement was found more efficient in thicker, cold rolled copper than in thinner soft copper.*

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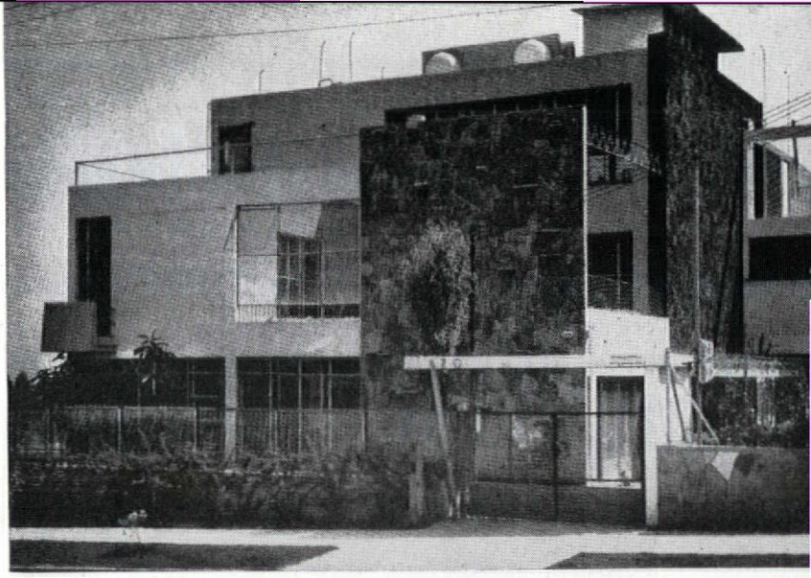
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REVIEWS





House at Lomas de Chapultepec (left) is by 35-year old Juan Sordo Madaleno, was finished in 1946. Above is street facade of town house by Antonio Pastrana.

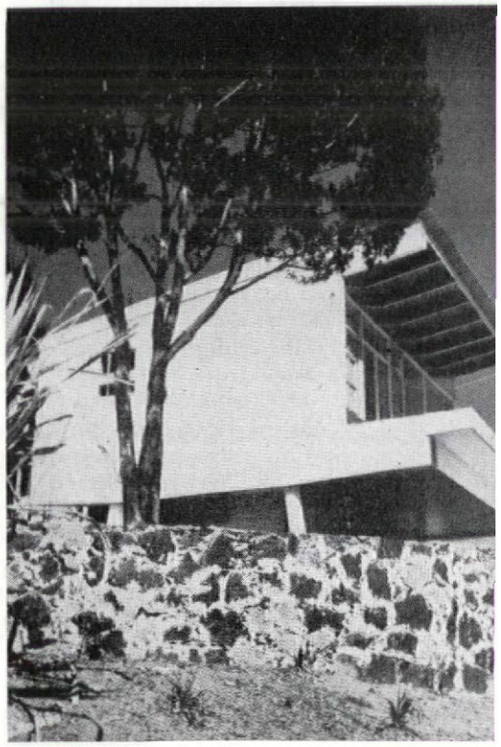
EIGHTEEN HOMES OF MEXICAN ARCHITECTS. Introduction by Enrique Yanez. Text in English & Spanish. Ediciones Mexicanas. Distributed in U. S. by Rogers Book Service, New York, N. Y. 118 pp. 9½ x 13. Illus. $6.

Modern Mexican architecture has generally followed trends in modern architecture elsewhere—except in one respect: from the very beginning it has been more daring and more imaginative in the use of traditional materials and textures. This was due in part to existing technological conditions; but beyond that it reflects a certain esthetic bravado not known in the more industrialized nations of North America and Europe.

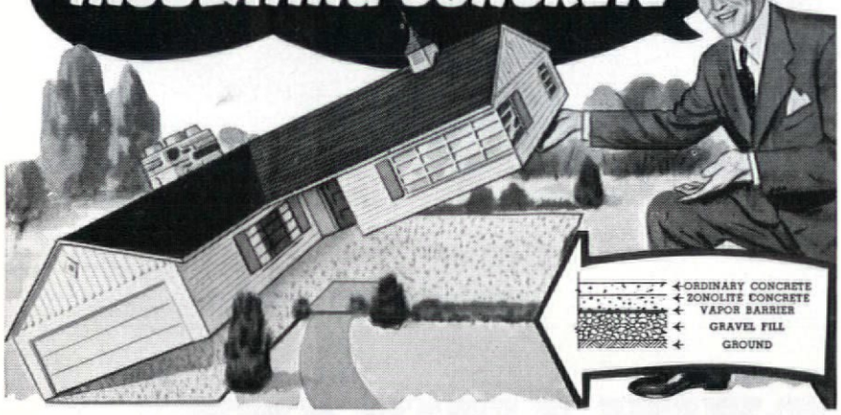
This early use of natural materials in exciting textural patterns had a strong influence upon modern architecture elsewhere. While rubble stone and textured concrete are now accepted trademarks of international architecture, Mexican architects have used these devices for years. This book depicts some of their more recent efforts in that direction.

(Continued on page 116)

House on stilts by Luis G. Rivadeneyra, 1947.



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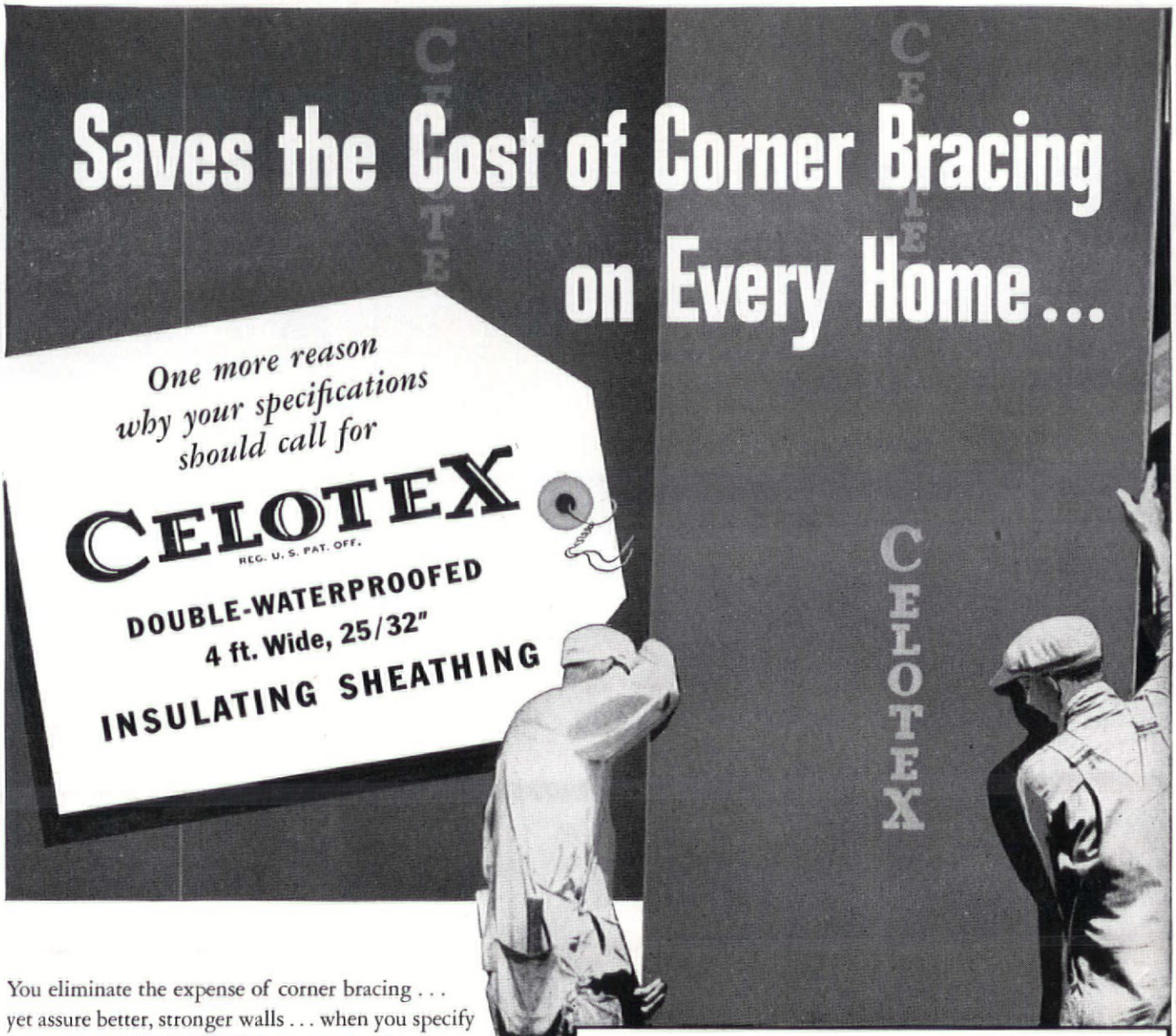
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Residual Deflection,* in.	0.1	0.14	0.067	0.040
At Load of 2400 lbs. Average Total Deflection, in.	0.6	0.8	0.533	0.483
Residual Deflection,* in.	0.3	0.4	0.230	0.187

*Deflection remaining after removal of load

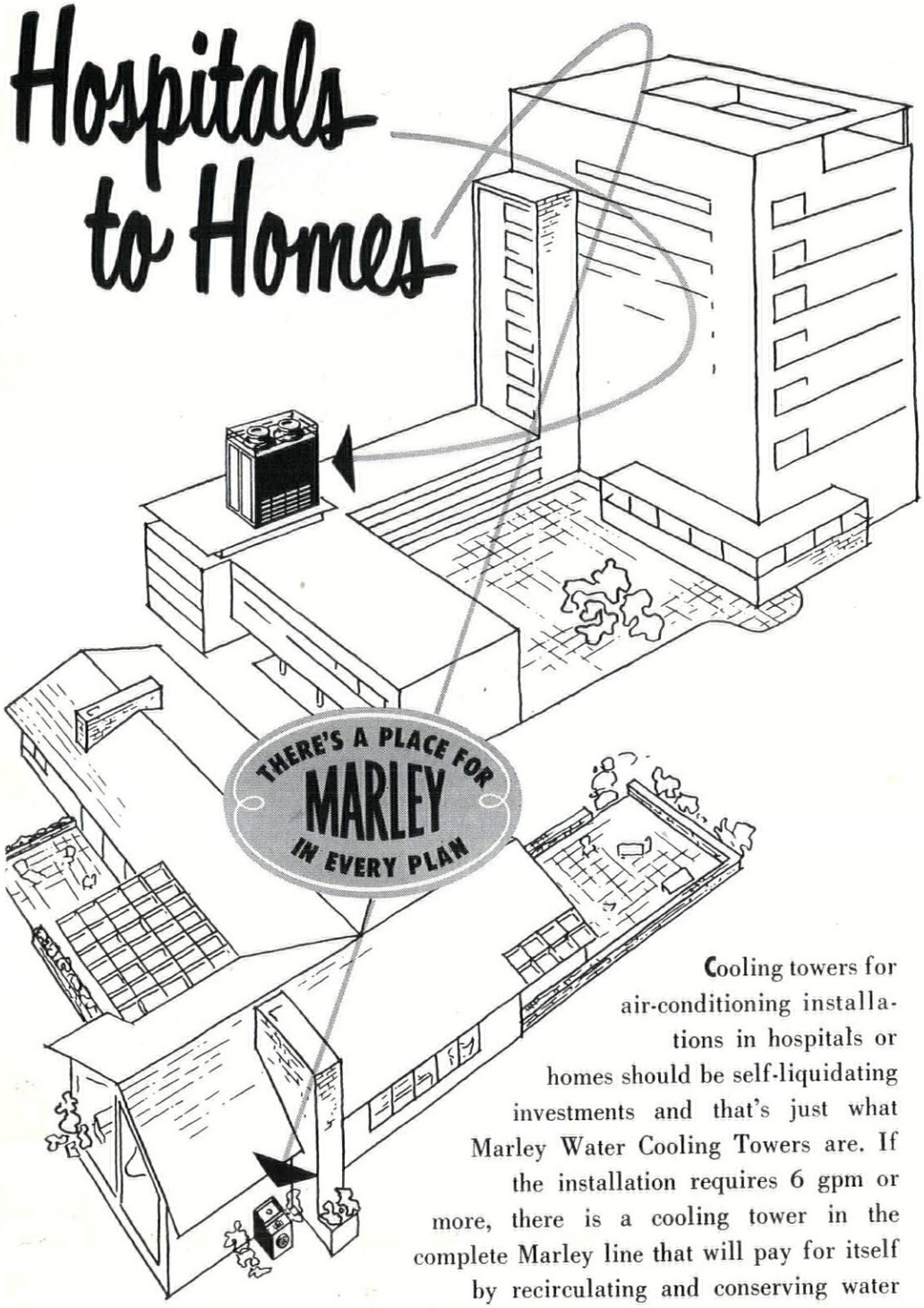
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REVIEWS



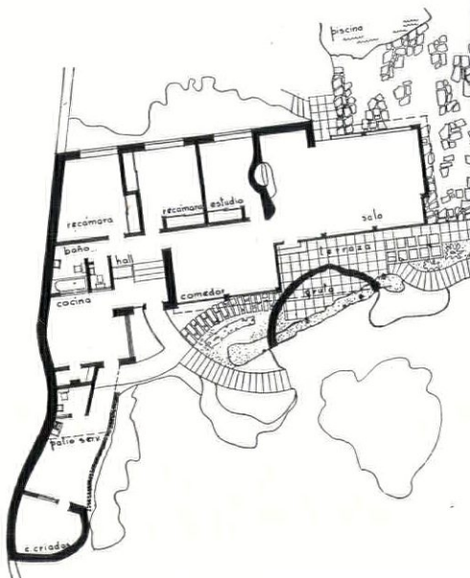
Early (1933) house in Mexico City was designed by Jose Villagran Garcia, is similar to modern California work of 1920's.

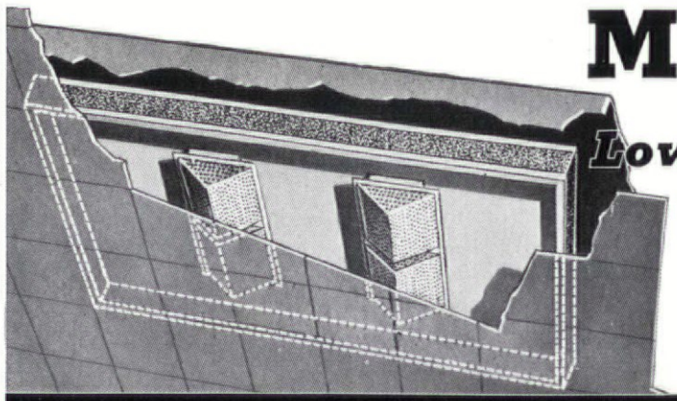
There is evidence of another trend in this collection of 18 Mexican houses: This is a widespread softening of form as well as of surface texture. A few of the houses still have the uncompromising geometry of the early Neutra and Schindler houses in California; but among the more recent examples there are several in which plans have become more fluid, forms have become more free and the overall result more baroque. Whether or not this is a desirable tendency may be debated; in any event, its simultaneous appearance in Mexico and in Switzerland, in California and in Sweden, suggests that this return to a more baroque idiom is based upon some kind of world-wide reaction against mechanization.

It is difficult to tell whether the present book is truly representative of the best in residential architecture in Mexico. Most of the houses shown owe a good deal to the leaders of international architecture—to Le Corbusier, to Mies, to Neutra. Few of them seem to show any direct influence of Wright's work—a curious fact in view of Wright's interest in Mayan architecture.

However accurate this picture may be, the book is an overdue reminder of some of the exciting work being done to the south of us. One only wishes that the photographic reproductions had been of better quality.—P.B.

Plan of country house by Max Cetto, built in 1949, reflects a new baroque, less geometric trend.





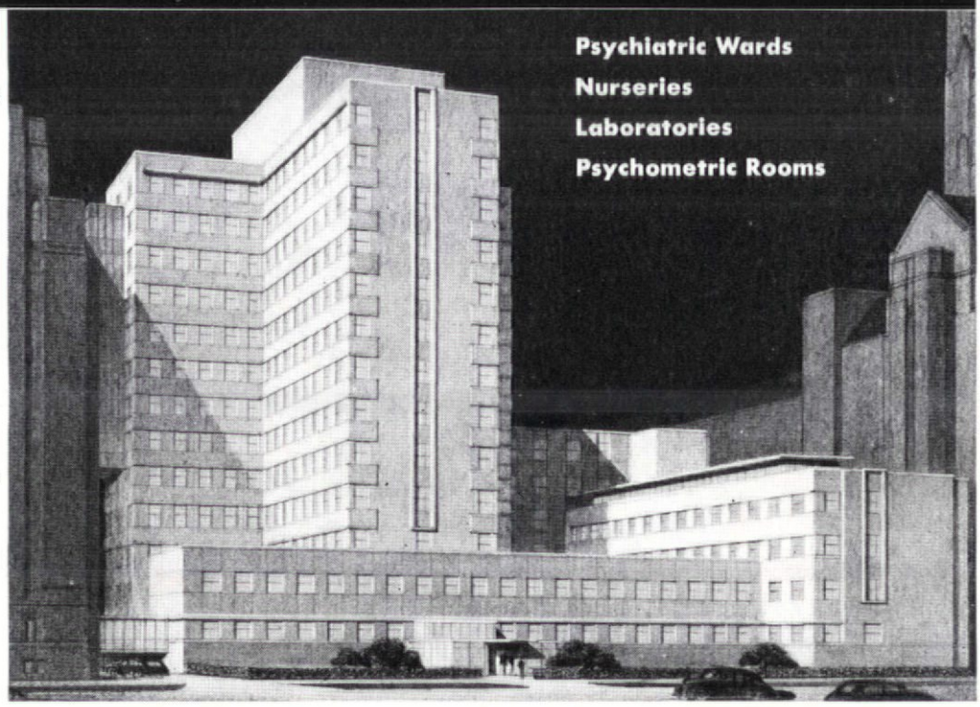
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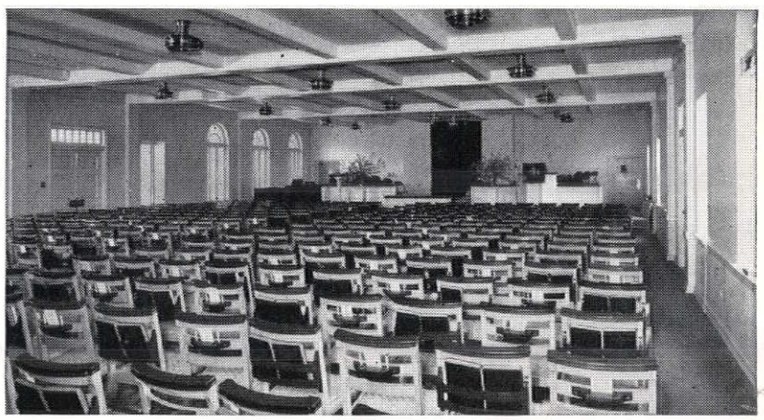
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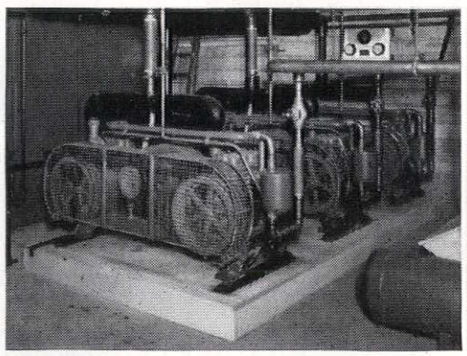
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Counsel, Mortgage Bankers Assn.

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Here are the unanimous recommendations of the leading home builders, mortgage bankers, savings bank and insurance company investors whose Round Table report on the mortgage crisis appeared in June in THE MAGAZINE OF BUILDING. *The savings and loan representatives did not join in the recommendations. For their divergent views, see page 55.*

The present FHA-VA mortgage crisis calls for quick relief measures to avoid a major disorganization of the home-building industry early next year, particularly throughout the South and West, and we have agreed on five specific recommendations which we believe will help to meet this immediate need:

1. VA and FHA should unfreeze at once the yield on VA and FHA loans, probably by allowing larger originating fees;

2. As soon as the yield is allowed to match the recent increase in bond yields, the large investors who normally rely heavily on FHA and VA loans as an investment outlet should cooperate in re-opening the market;

3. Many investors should look to simplification of their own servicing methods for the quickest way to increase their net yield on FHA and VA loans;

4. The interest rate on the debentures FHA can issue on foreclosure should be increased at once, and in some cases their term should be shortened;

5. The market for insured mortgages must be broadened. This calls first for more aggressive selling by the mortgage bankers, but this effort to interest new types of buyers might be helped by repackaging the loans in a form which would make them more attractive to bond-minded investors who are unaccustomed to buying mortgages and are now influenced unfavorably by the unfamiliar paper work they involve.

These emergency relief measures may not be enough to safeguard the industry against future money crises or to assure home building the tremendous flow of mortgage credit needed to provide one million new homes a year (enough to keep up with family formation and replace the four million existing homes over an 80-year cycle). Residential home building requires more long term credit than all other industries combined, and consequently it is a matter of special concern to home building that steps should be taken to increase the total rate of savings, which in recent years has not been sufficient to meet the total demand for long term funds without excessive use of Federal Reserve Bank credit.

Since the Federal Reserve was founded in 1913, no other industry has been subject to the repeated credit crises which still beset home building, and we believe it is high time to consider the creation of a central mortgage bank with more adequate powers to smooth out the flow of mortgage money and make these crises less frequent and less severe.

All these proposals are discussed in some detail on the following pages.

The immediate crisis

We have already agreed on the major causes of the sudden crisis in FHA and VA mortgages:

1. Since March 3 the competitive attractiveness of FHA and VA loans has been reduced because their yield has not been allowed to increase as much as the yield on government and high grade corporate bonds since the Federal Reserve stopped supporting governments at par or better. Because of the plant expansion required by rearmament and the advantages the excess profits tax offers on borrowing, a great volume of corporate bond issues is being offered at substantially higher yields this year.

2. On March 3 the banks and insurance companies were already more heavily committed to buy mortgages than in the record year 1950. They were committed for more mortgages than they could absorb without selling governments.

3. Investors can no longer sell governments to switch to mortgages without taking a loss of around 3 points on the governments, and under voluntary credit control investors are being urged not to make loans which require the sale of governments.

To meet the immediate problem, we offer these specific recommendations:

FHA and VA should unfreeze the yield on VA and FHA loans at once to let their yield keep in line with the increased yield on government and corporate bonds.

We believe it is more than a coincidence that since March 3 the only yield frozen by the government has been the yield on VA and FHA loans, and since March 3 these have been the only loans for which demand has almost disappeared. All other borrowers, including both the public housing authorities and home builders who could use conventional financing, have been able to get all the money they needed by increasing their bid (i.e., offering a higher yield).

If FHA and VA cannot, or will not, meet the demand for a higher yield on FHA and VA loans directly by raising their interest rate ceilings, they should meet it by permitting up to 2½% higher discounts or 2½% higher originating fees for the benefit of the investor.

The lenders among us all feel it would be better if FHA and VA would face this problem squarely and openly by authorizing higher interest rate ceilings. The lenders recognize, however, that there is truth in the builders' contentions that:

1. There are great and perhaps insuperable political obstacles to such an increase in the interest rate. Within the past month, both the Senate and the House have separately reaffirmed the veterans' right to a 4% mortgage through direct government loans at 4% to veterans who cannot get 4% loans from private lenders. As long as this policy stands, and as long as the funds appropriated hold out, any increase in the VA mortgage rate would just send more veterans to the government and less to private capital for their mortgages. On the other hand, an increase in the FHA rate without an equal increase in the VA rate would probably divert to FHA much of the money now going into VA loans.

2. Last year, when the market showed VA and FHA interest rates were higher than necessary, the situation was met by substantial premium payments by lenders (up to 3½ points on FHA) to obtain the business. If the problem of too high an interest rate could be met by a premium, there is no insuperable reason why the problem of too low an interest rate cannot be met by in effect allowing a discount through an increase in the approved financing charge. Most Federal long-term bonds are new selling at a discount. Corporate bonds are often brought out at a discount. Why, the builders ask, should FHA and VA loans alone be forbidden to meet the market in this precise way?

FHA loans have already made a partial adjustment to the higher return on competing investments, for last year's premiums have practically disappeared and few FHA loans are being placed at more than 99 (i.e., most new loans now reflect a discount equal to the 1% financing charge which is the maximum FHA allows on permanent loans). This drop to 99 almost equals the fall in Federal bond prices and is nearly half the drop in corporate bond prices. VA loans, which were selling at par last year, have been unable to make an adjustment of more than 1 point. If VA and FHA should now add say 2½ points to the present maximum legal financing charge, that change should be enough to restore FHA mortgages to the same competitive advantage they had over all other securities up to March 3, when the demand for them seemed almost unlimited, and it should reopen the market for VA loans. In fact, such an increase in financing charges for FHA and VA mortgages could make these mortgages more attractive for general investment funds than was the switch from governments at par to FHA loans at a premium last year.

The sooner this change is made, the sooner the VA and FHA mortgage crisis will be over and the sooner the market for VA and FHA loans will reopen. (In fact, some of us believe the hope of higher yield ceilings later has been reason enough to keep many investors out of the FHA and VA market.) When the market does reopen, it may soon show that the builders have been right in arguing that the need for higher yields was only temporary. The rate of savings is rising. New corporate borrowing is expected to decline substantially. The demand for mortgage money has been greatly reduced under Regulation X. When, as and if the higher yields cease to be necessary, market competition for borrowers can eliminate the higher discounts just as readily as market competition for lenders after March 3 eliminated the premiums which were customary as late as February.

Not all FHA mortgages need sell at a discount even today. The larger issues, on which servicing and accounting costs are much lower, should be attractive at par, and some are still commanding an occasional premium.

As soon as the yield on VA and FHA loans is brought back in line with competing investment offerings the institutions which normally rely heavily on VA and FHA mortgages as an investment outlet should return to the market and start making commitments which will enable volume builders dependent on FHA and VA financing to start making their 1952 plans.

We realize that most big lenders are already committed for all the new investment funds they expect to have available for mortgage investment for the balance of 1951 and a few are fully committed through Feb. 1952 or beyond. But that seems somewhat beside the point. Advance commitments made now would require almost no cash in 1951, very little before next March. Many lenders already know within narrow limits what moneys they will have available for investment early in 1952, and they would normally be committing heavily now for next year.

The lenders among us realize just as clearly as the builders that they have too big a stake in home building to turn their backs on the home building industry whenever a slightly higher return is offered somewhere else. They recognize that they have a social responsibility for maintaining a more or less stable fund for mortgage investment, and they agree that as soon as FHA and VA permit a comparable yield they should make every effort to return to the market just as quickly as possible.

Primary responsibility for last year's inflationary markets, including the market for housing, must fall on the government's inflationary policies.

We are all agreed that it is bad for home buyers, home builders and home mortgage investors alike that that sector of the home building industry which is dependent on FHA and VA loans should

A Central Mortgage Bankto Expand and Stabilize Mortgage Credit

Ever since FHA was started (and before) lenders and builders alike have been talking about a mortgage bank. Some want such a facility to smooth out the flow of credit. Some want it to tap added funds. Others hope it could prevent mortgage crises from getting as serious as the present.

Nineteen years ago the savings and loan societies got a mortgage bank—The Federal Home Loan Bank. Though its powers are limited, it has been a great help to the institutions for which it was established, enabling them to invest more more than 100% of their deposits in mortgages and so enabling them to offer much higher interest rates on their deposits than the mutual savings banks, each of which is required to maintain high liquidity by keeping a large percentage of its funds in cash or low-interest government securities. It is thus one reason the savings and loan societies have grown so fast.

A second step towards a central mortgage bank was the provision for national mortgage associations under Title III of the National Housing Act of 1934, in order to provide a dependable secondary market for mortgages. The only association formed under this act was the government-owned Federal National Mortgage Association. In practice, this association has not provided the kind of secondary market contemplated by the act. On the contrary, in many years it has been used primarily to help market new mortgages whose terms were not sufficiently attractive to sell in the current market (for example, it put many millions into VA 4% loans when they were unmarketable in 1948, and it has earmarked $350 million for defense area loans today). It has always been tied to FHA, VA and their programs, and even today is doing little to ease the crisis; for it is trying to sell old mortgages as fast as it buys new ones.

We doubt if any mortgage bank can function properly as long as VA and FHA interest rates are made to reflect political pressures rather than market needs (just as the Federal Reserve was handicapped for years by Treasury control). But assuming some steps are taken to unfreeze the yield on FHA and VA mortgages, we believe it is high time to give the most careful consideration to setting up a central mortgage bank.

Probably the logical institution to develop in the direction of a central mortgage bank is the present Federal National Mortgage Association. We recommend, therefore, that serious consideration be given to transferring the ownership of FNMA to the approved mortgagees of the country under a plan which would require all of them to own stock, i.e., a plan similar to that under which the member banks must own stock in the Federal Reserve Banks and Federal Savings and Loan Associations must own stock in the Federal Home Loan Banks.

With the ownership of FNMA in the hands of private investors they should have some say in its operation, though its board of directors, following the precedent set by the Federal Reserve and the Federal Home Loan Boards, would require broad representation from the government, the public and the mortgage banking interest. Among the possibilities such a plan would create are:

- Instead of depending on the Federal treasury for funds, we believe a privately owned FNMA could sell debentures to the public, both long term and short term. The inclusion of short term debentures would bring down the average interest cost and thus permit FNMA to operate on lower gross returns on government-insured mortgages. This procedure might offer the easiest way to tap new markets like the pension funds.
- The power to establish interest rates on FHA and VA mortgages could be transferred from the Federal Housing Administration and from the Veterans' Administration and vested in the FNMA, on which VA and FHA could, of course, be represented. The Federal Reserve Board has the right to raise or lower re-discount rates. Why should not FNMA be given similar authority to change interest rates as the market requires?
- Under private ownership FNMA could be converted into a pool into which mortgages could go when funds are short and from which mortgages could be sold to member institutions when there is need for investments. Any debentures issued by FNMA should be callable to permit this type of operation.
- FNMA could be geared to purchase mortgages in any place in the country. Present mortgage buyers, even the largest, do not carry mortgage programs into small towns and rural communities. FNMA could and should do so.
- Debentures issued by the central mortgage bank might be re-discountable in the Federal Reserve Banks. This would give a degree of liquidity that would help in times of tight money.

first be over-stimulated as it was last year and then threatened with a complete shutdown as it has been this year. And whatever the government's responsibility may be, we all recognize that the large lenders, given reasonable conditions under which they can operate, must assume increasing responsibility for keeping the flow of mortgage investment funds reasonably level, since periodic money crises have been an important factor in the cost of home building and an important obstacle delaying the development of a stable, competitive home building industry capable of supplying much better housing at much lower cost.

Any large qualified mortgagee whose internal costs for servicing FHA and VA mortgages exceed 15 cents per $100 per year (after paying 50 cents for external servicing) should give careful study to his methods.

Many large investors will find this streamlining of their own operations the quickest way to increase their net yield on FHA and VA mortgages. One small insurance company with the advantage of a high average loan ($30,000) has reduced its internal costs to 9 cents a year on every $100 loaned. A large bank has installed a new system which has cut its costs to 12.3 cents per $100 on loans averaging $12,000. Some believe internal servicing costs can be cut much lower than even these figures, and the methods experts of the Mortgage Bankers Association say there is no reason why all large lenders should not get their internal servicing costs down to 15 cents, smaller lenders to 18 cents. Yet the average today is still above 25 cents and in many institutions is more than 50 cents.

These economies will be possible only with an efficient and thoroughly reliable local agent capable of supplying records in such form that duplicate bookkeeping will be unnecessary. They will probably require either a punch card system, or a system making full use of preposted records and amortization schedules, or some other advanced method simplification. They may involve at least partial use of the system known as "negative bookkeeping". They usually involve making the agent assume full liability (perhaps with an errors and omissions policy) for keeping the mortgaged property fully insured against fire—a liability the agent should be willing to assume.

The interest rate on FHA debentures should be increased at once to keep it in line with the higher prevailing rate on other government obligations.

Since March 3 a new element of risk has been injected into FHA mortgages, for the debentures for which they are exchanged in the event of foreclosure may no longer be worth par. We realize that FHA has been (but is not now always) calling its debentures immediately at par, and we realize that in any event the value of FHA debentures will always be pegged by the fact FHA must accept them at par in payment of FHA mortgage insurance premiums, but that does not eliminate the possibility that FHA might elect to defer its call and allow its paper to depreciate.

Before March 3 the interest rate on FHA debentures was the same as the interest rate on government bonds then selling at par. As a result, the debentures were practically as good as cash. FHA has authority to make the interest rate on its debentures again the same as on current treasury offerings. It should do so promptly.

At the same time, Congress should shorten the term of certain debentures. For example, FHA 207 loans are now especially hard to place and will continue hard to place as long as their debentures may run three years longer than the maturity of the foreclosed 207 mortgage. We recommend that no debentures should run longer than ten years. Certainly they should not run longer than current treasury offerings paying the same rate of interest.

The market for FHA and VA loans must be broadened

Since the war and right up to last March 3, the banks and insurance companies were reducing their holdings of government bonds and were providing a market sufficient to buy practically all the government insured loans that were offered. Consequently, the mortgage bankers did little to develop additional outlets in the pension trusts, mutual funds, and other increasingly important new types of savings to which these mortgages might have been made equally attractive. Why should these latter be putting almost no money at all into the investment field in which the older investors were finding the best of all investment opportunities?

Last month the Mortgage Bankers Association named a committee to meet with leading pension trust representatives and work out plans for attracting more of these funds to the insured mortgage field. We heartily commend this undertaking and hope it will be followed by other similar moves to broaden the market.

Even with the higher yields prevailing on government and corporate bonds since March 3, many institutional investors believe that no other investment involving so little risk offers so high a net return as FHA and VA loans. One obstacle to their wider sale is that many investors have neither the inclination, the incentive or the organization to undertake the internal servicing problems they entail, nor do they wish to assume the responsibilities of having their own mortgage correspondents. These investors might be much more ready to buy insured or guaranteed mortgages if methods could be worked out to relieve them of this work.

Some further considerations for the long pull

If we are to have a stable home building industry providing a million new homes a year (enough to keep pace with family formation and replace the existing 40 million homes over 80 years), it will be necessary 1) to increase the total rate of savings, and 2) to attract a larger share of those savings to the mortgage field.

Everyone should understand that since the war the rate of savings has not been sufficient to provide credit for a million new homes a year and at the same time to meet all the other demands on the money market. On the contrary, some of these credit demands have been met by the wholesale unloading of long-term government bonds onto the Federal Reserve Bank.

New mortgages require more savings each year than all new public offerings of corporate, state and local bond issues combined—an average of about $5,600,000,000 a year for 1947-48-49-50—a staggering total of $7,833,000,000 in 1950 alone. From 1945 to 1950 total savings in the insurance companies, savings and loan societies, savings and commercial banks increased $34.7 billion. This five-year increase was only $5.2 billion more than the $29.5 billion increase in the mortgage debt for the same period!

In the second half of 1950 (admittedly a short period) when mortgage debt was rising at the record rate of $11,500,000,000 a year, governments were actually being unloaded at the rate of $12 billion a year. This purchase of governments by the Federal Reserve is highly inflationary and could not continue much further. Nor could many big institutional investors be expected to go on much further increasing the percentage of their funds invested in mortgages. (For savings banks this is expected to rise from 40% to 50% in this one year.)

Government policy for the past 18 years has discouraged savings, first by holding interest rates down to artificially low levels, and second by an almost continuous policy of inflation which has eaten away the value of savings at a rate actually faster than interest could accumulate. This Round Table obviously cannot undertake to solve the whole problem of inadequate savings. We can, however, point out that . . . *Homeownership can and should be a great source and means of savings through the paying-off of mortgages, just as it is the greatest user of savings through the creation of mortgages.*

Until recent years, savings through homeownership were almost enough to supply the funds needed for new home financing; for example, in 1929 mortgage repayments were $3.065 billion; new mortgages were $4.4 billion. In 1939 repayments were $2.3 billion; new mortgages $2.8 billion. The great increase in home building and the higher percentage of home construction costs now covered by the mortgages only partially explain why this almost-balance has been upset. The other reason is the government-approved trend towards slower and slower amortization. In 1929 the term of most amortized mortgages was less than 15 years; in 1949 it was nearer 25 years, with new single-family FHA and VA mortgages some times running 30 years. On a 25-year 4% mortgage, 13% is paid off in the first five years; 29% in the first ten years.

Amortization rate—package and open-end mortgages

There is now some reason to believe Regulation X may have to be relaxed if the government's announced quota of 850,000 new homes is to be realized next year. This relaxation could take the form of lower down payments or a slower rate of amortization. We believe the higher down payments now required by Regulation X add little or nothing to the rate of savings. They represent only the transfer of past savings from one investment to another, usually the withdrawal of savings accounts or the sale of government savings bonds.

On the other hand, the accelerated amortization required under Regulation X does compel additional monthly savings. If Regulation X is relaxed, we recommend that the relaxation be confined to lowering the down payment required. During this emergency, when increased savings are so important, the amortization rate required by Regulation X should not be reduced.

Finally, we believe FHA should consider certain modifications to make its mortgages fit more realistically the actual needs of the home-buying public. We believe the terms of many present FHA loans may be inadequate to meet these needs in the early years, at the same time they may also be too costly in the later years.

In the beginning most home buyers need stoves, refrigerators, dishwashers, garbage disposers, wall-to-wall carpeting, etc., which can be most economically provided as part of the original house. Soon they begin to need credit to add garages, extra rooms, extra equipment.

(Continued on page 222)

GLASS CENTER is a "human relations center"

LOCATION: Corning, New York
HARRISON, ABRAMOVITZ & ABBE, Architects
GEO. A. FULLER CONSTRUCTION CO., General Contractor

Since May 30 when the doors were opened to the public, well over 125,000 people have thronged through the new Glass Center at Corning—seven times the total population of the little city in the Chemung Valley of upstate New York. To lure visitors at a steady rate of better than 2,000 a day to a relatively unknown little mill-town would in itself be an extraordinary success for a building which the Corning Glass Works dedicated to an industry's public relations.

Glass blowing is the deceptively ready—but incomplete—explanation. The people come to see a magic skill that drew other throngs 500 years ago to Venice, and 3,000 years ago to the Valley of the Nile—a skill that is doubly enchanting because of its anachronism in an industrial age.

Yet if the Glass Center were merely an industrial version of Colonial Williamsburg, a showcase factory with an extra gimmick, its example to other industrialists would be not half so significant as it really is.

What distinguishes the building assignment that Corning's Amory* and Arthur Houghton† gave to architect Harrison is the fact that the building was intended to serve an industry not only in its public relations but in the whole range of its human relations. The Glass Center is a combination contact point and experimental station dealing in a threefold way with the industry's public, its community, its employees.

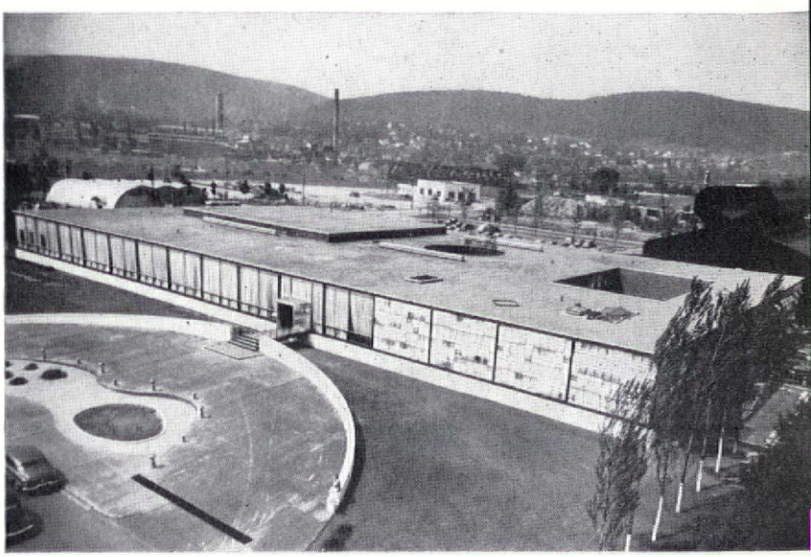
For the public, architect Harrison and partners Abramovitz and Abbe were asked to supply three kinds of education in a manner appetizing to a "voluntary" audience.
This included:

- A museum to show a choice collection of fine glass going back to Egypt.
- A library—the world's most complete collection of books and manuscripts relating to glass.
- A demonstration, through audio-visual techniques, of "every skill, technique, formula, and use of the product, glass, out of any age or country."

In setting forth to educate the public, the Corning people enjoy the enormous advantage that their Steuben division, under the presidency of scholarly, artistic Arthur Houghton, produces fine crystal entirely by hand.

Says Houghton, "In showing the public what glass is like we emphasize hand processes because the man dominates the material and the process may be more readily grasped. The hand of man is the most complex machine there is, but it is slow in motion, so that its action is understood. Machines represent a totally different kind of organization—the same machine may cut across several materials or industries; moreover the machine overwhelms the material, and it works too intricately and fast."

*Chairman of the Board. †President, Steuben Division.



Corning Glass Center marks entry from the north (the Finger Lakes region) to a typical U. S. one-industry town of 19,000 people, in the pretty valley of the Chemung. The dark shop building at right, with ear-shaped ventilators, is the Steuben glass blowing room.

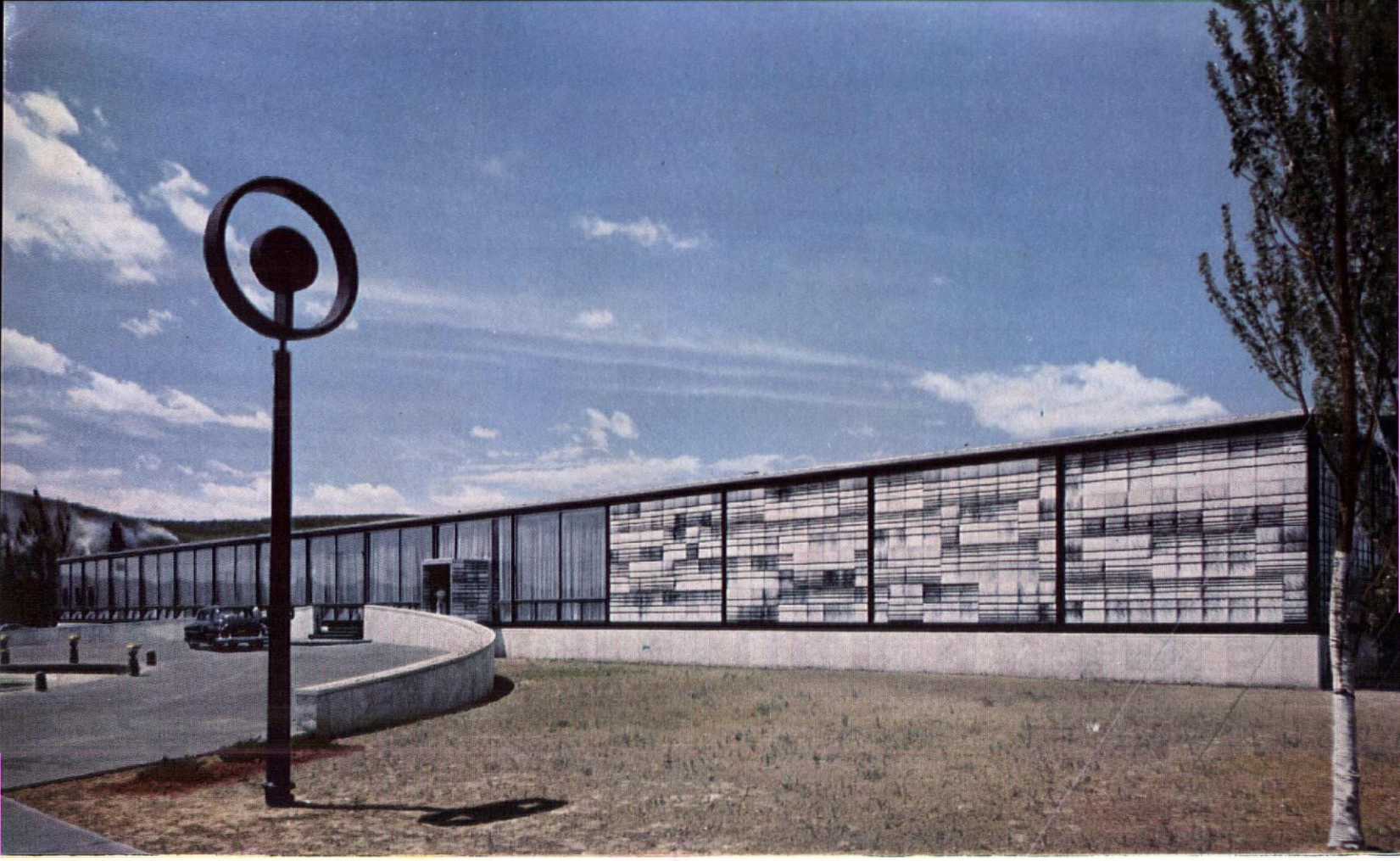
In relation to his employees, Arthur Houghton wanted first-off to use his "showcase plant" as a human-relations lab. When he asked architect Harrison to make the entire Steuben process in some degree visible, he was thinking not only of an admiring public but of the worker who—as a rare thing in industrial society—would have some sense of an audience, would be appreciated—"See, there's Papa."

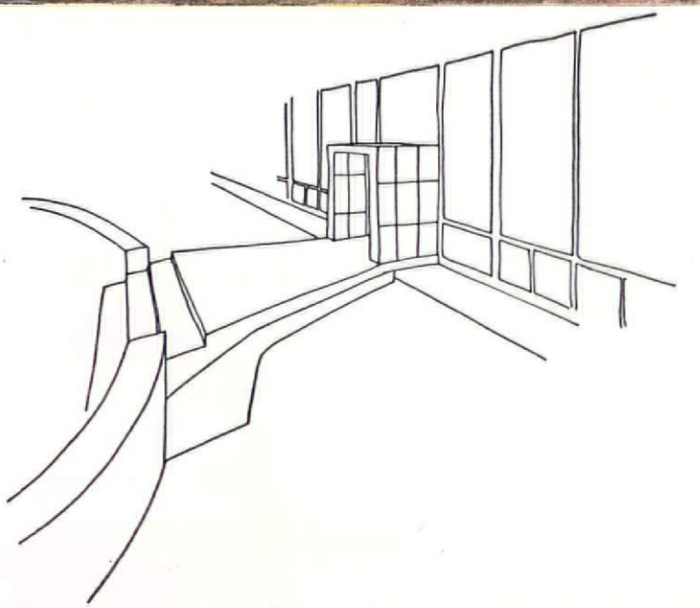
The maestro of the glass process, the princely "gaffer" doing freehand miracles with the hot liquid, could be expected to love his audience. How long would this last? How would it affect the permanent volume of production? And how about the laborer further back in the shadows?

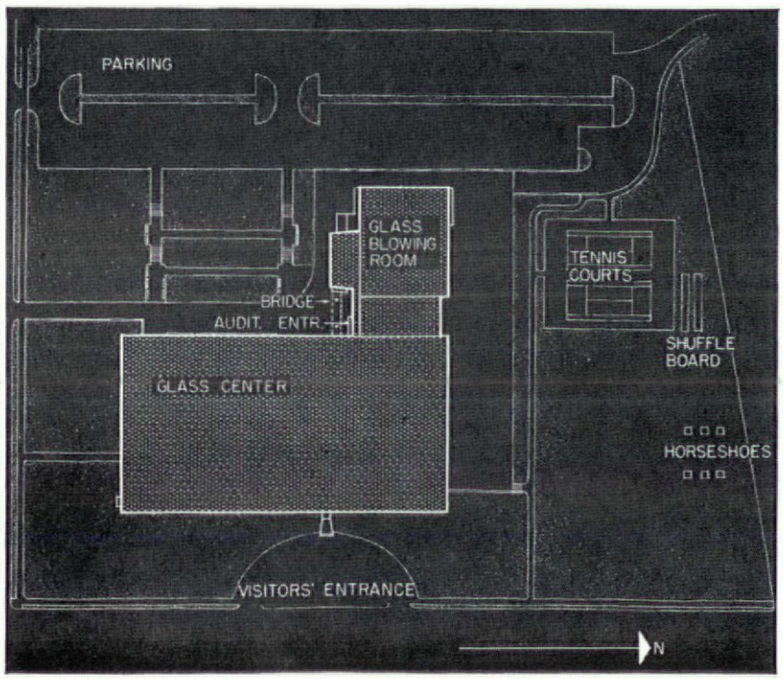
The community in a town dominated by one company is largely made up employees and their families; and the Corning people, up in "the sticks," were intensely aware that a superior man—and his wife—must be kept interested far from the metropolis. (There are 200 Ph.D.'s in the small town of Corning.) And yet there must be no "paternalism."

So the architects were asked to give the glass industry not so much a show window as a face, a building reflecting not just its public relations but its human relations.

The fact that they complied, with an outward simplicity and an unusual degree of inward grace, is important to other industries—even those whose products cannot literally "face" their buildings as glass does. Out of the show window factory and the community center a new building type has been created—the industrial human-relations center.





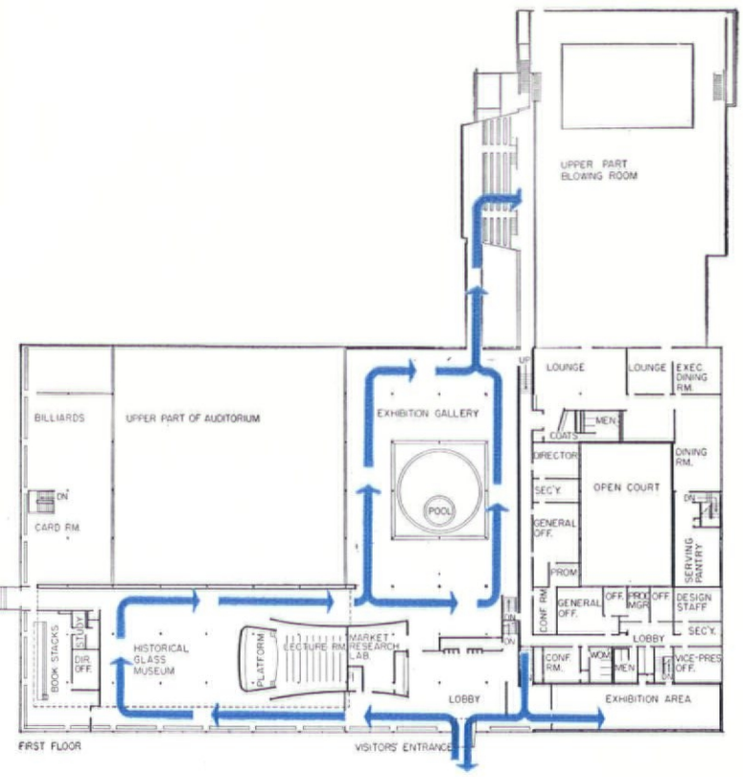


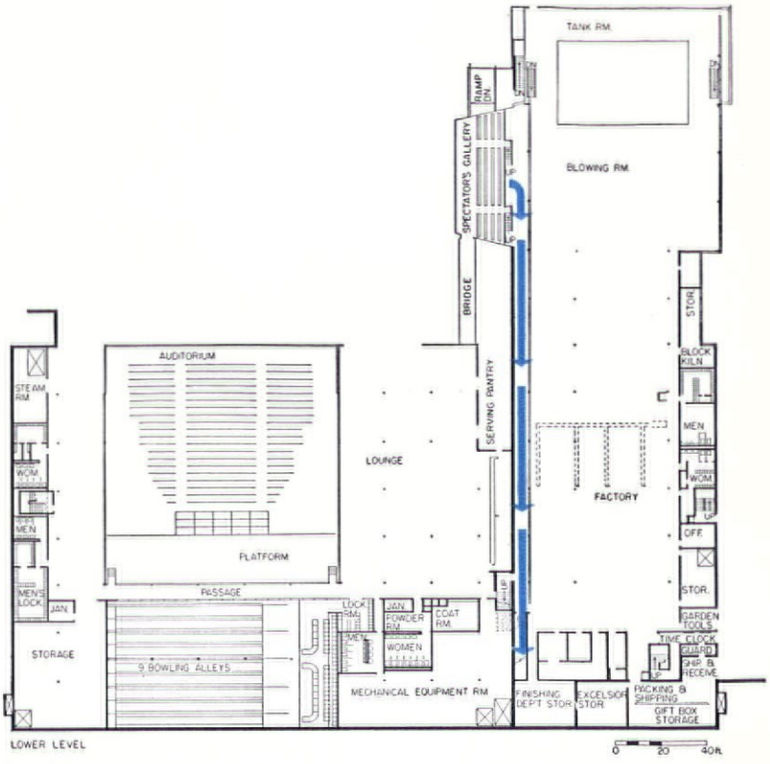
Three hundred feet long on its Vermont marble plinth, the street front of the Center begins to demonstrate new potentialities of glass the moment it is first seen. The solid, marble-like right end is faced actually with sheets of photo-sensitive glass (over concrete block); its pattern was printed from film. The adjoining "glass wall" is made up of plate glass sheets over hopper windows at the floor. Through the plate glass is seen the woven pattern of floor-to-ceiling glass fabric drapes. On the other side the auditorium is faced with patterned glass block (back end of the wall, see facing page). The connecting bridge to the blowing room is enclosed entirely with bent Pyrex tubing separated by special rubber gaskets. (Corning had produced the horizontal tubing for Frank Lloyd Wright's famous Johnson laboratory; but here the architects set it vertical, like croquet wickers, dizzying the passer-through.)

The entry porch is still built like a bridge—originally it was intended to cross a decorative "moat."

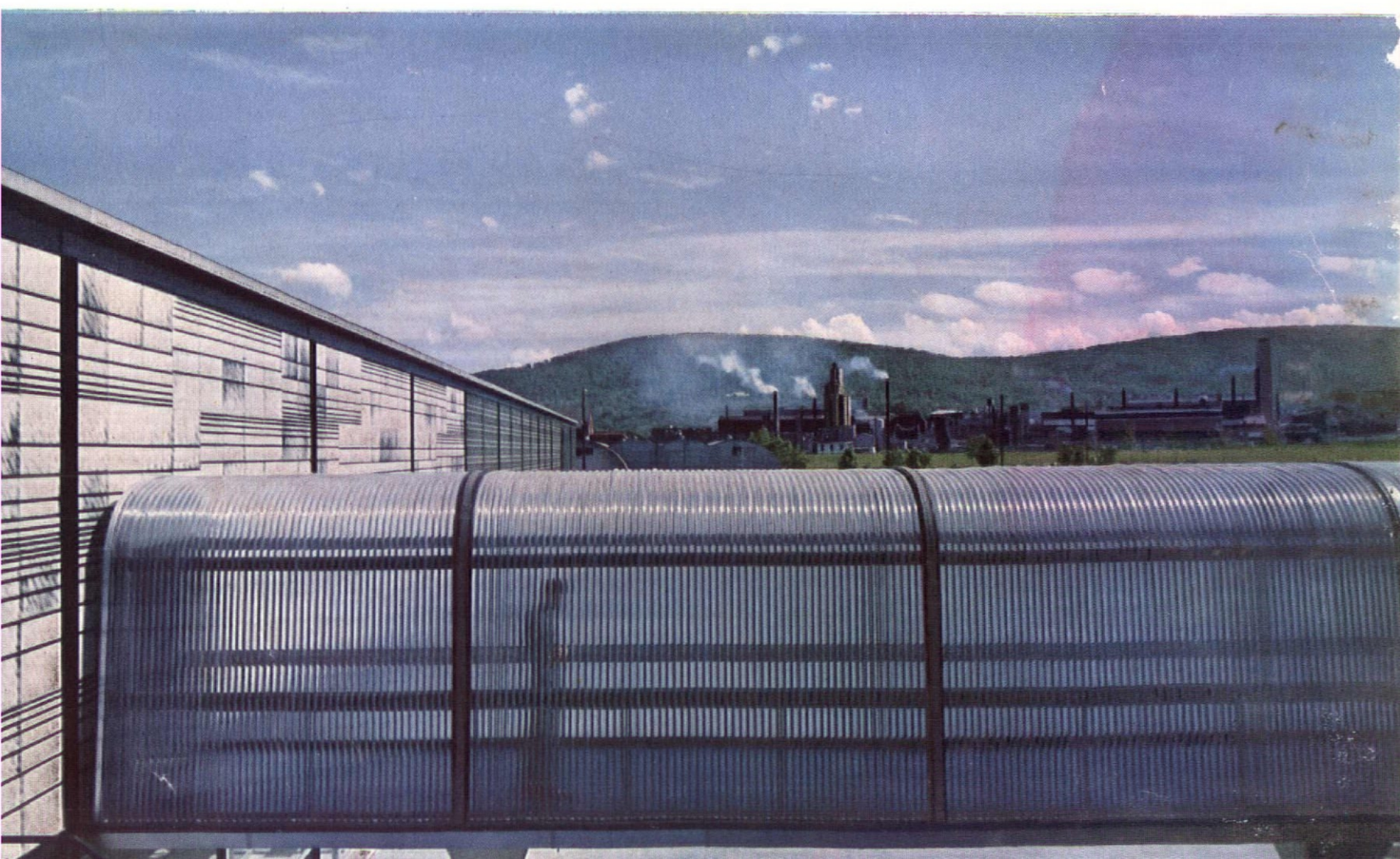
CORNING GLASS CENTER

"The very first view begins to demonstrate the material"





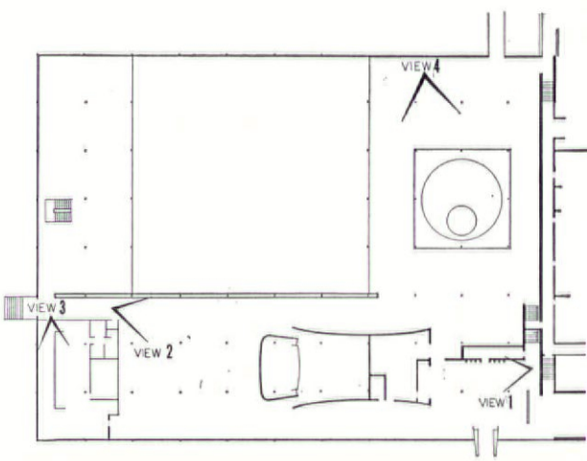
The plan of the Glass Center is basically an L, of which the vertical stem (to right of visitors' entrance, see above) contains the Steuben factory and the administrative offices, and the main block (to left of visitors' entrance) the educational and recreational facilities. Arrow shows routing of visitors. "They have to come out where they came in so as not to get lost," says Director James Brown. "Our only criticism is that the flow-lines might have been self-explanatory."



VIEW 1

VIEW 2





"The effect of Luxor"

Visitors enter through a vestibule (small photo) which acts as light trap, find themselves in a black lobby, facing the great luminous disk, turn into the passage at the left to enjoy brilliant glass displays set in the blue-black dimness. Like the oldest glass in the show, this architectural device of light sequences from black to skybright comes down from Egypt where the architects admired it; is supremely suited to the present objective.

CORNING GLASS CENTER

"Man's knowledge stored

and his activity explained"

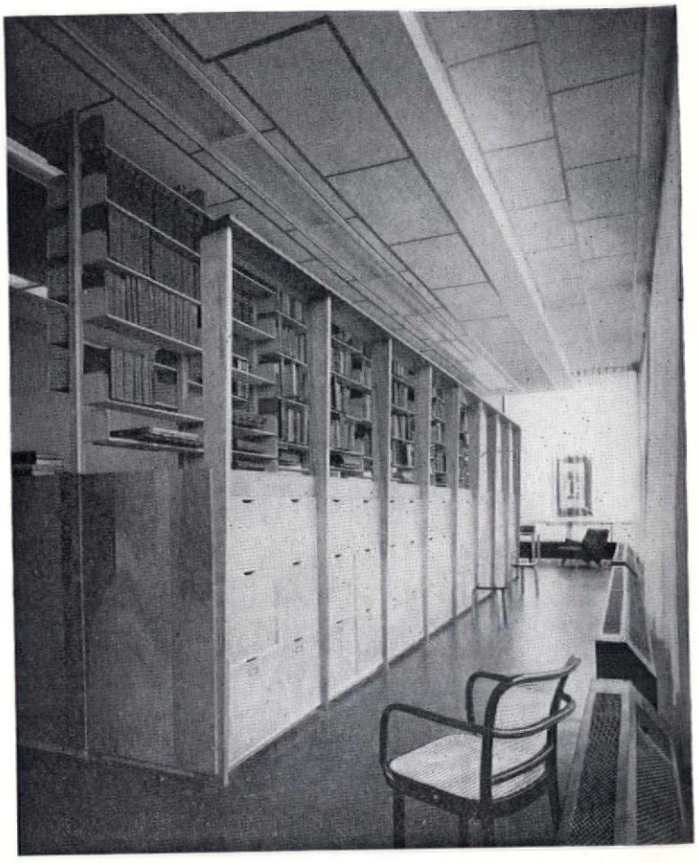
So that the public might learn and like it, Architect Harrison and his partners had to sort out some four kinds of display, each illustrated in one of the four photos on these two pages.

For drama, in the black entrance vestibule, they placed the original 200" 20-ton reflecting telescope disk made for the Mt. Palomar Observatory, then let light shine through it from behind, creating a rich yellow-green glow.

For reading, they stored the books, pamphlets, papers of the world's biggest glass library in a 2-tier arrangement of filing cabinets and shelves, in the bright southeast corner of the building.

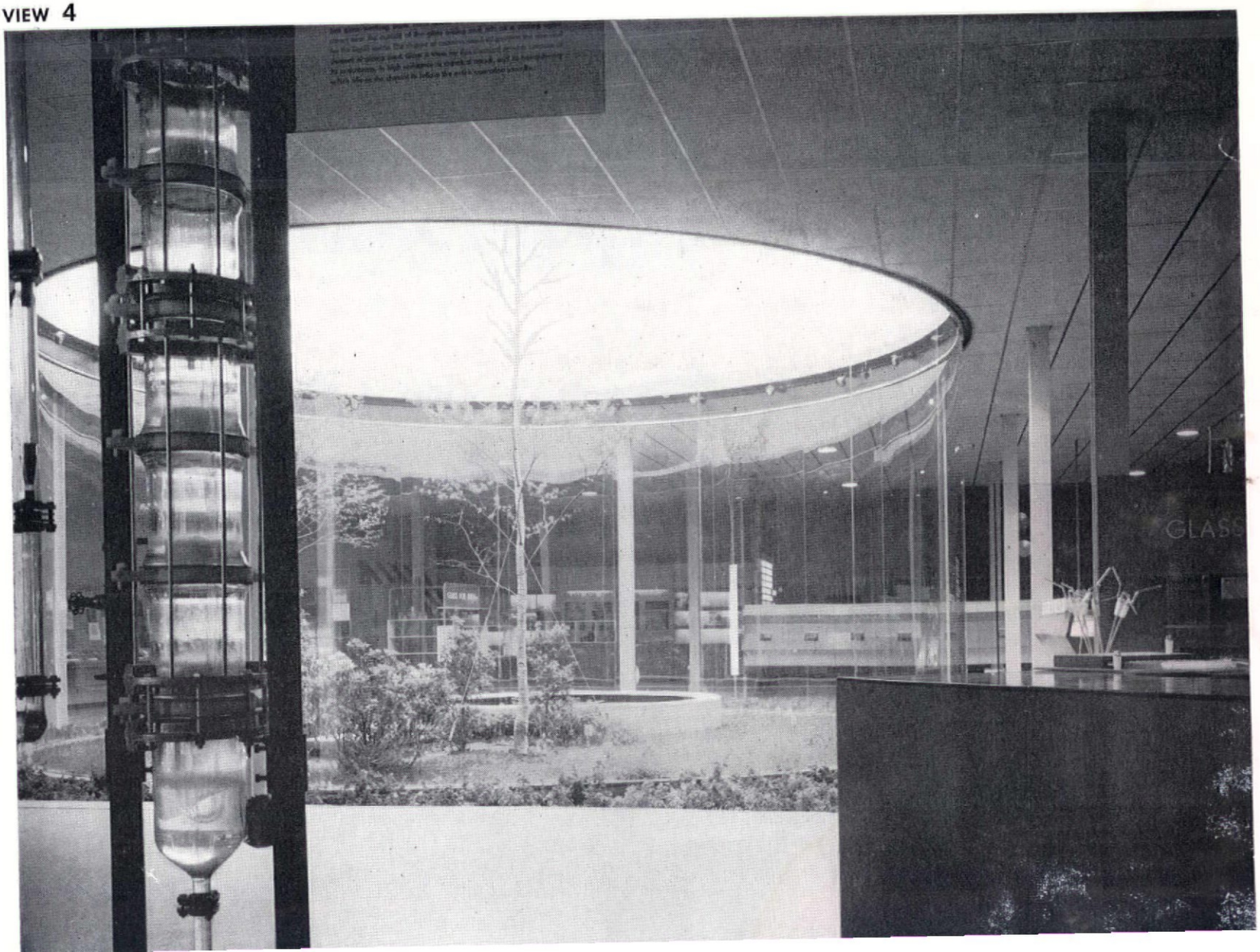
For historical display, they ranged the priceless exhibits, going back to Egypt, in top-lighted showcases faced with deep blue velvet, in a manner similar to that of the Metropolitan Museum of Art.

For audio-visual demonstrations, partly by machine, partly by hand, they used a skylighted open court. Weather-protection is achieved not by roof-glazing but by a glass cylinder of 36′ diameter surrounding the round light well. It is made of the four biggest sheets of curved plate glass ever made, delicately set down on lead shims. The glass-bottomed pool (seen behind the tree) lets green light into the auditorium foyer below; the square planting pattern keeps the public away from the glass, where breakage would be a considerable disaster.



VIEW 3

VIEW 4



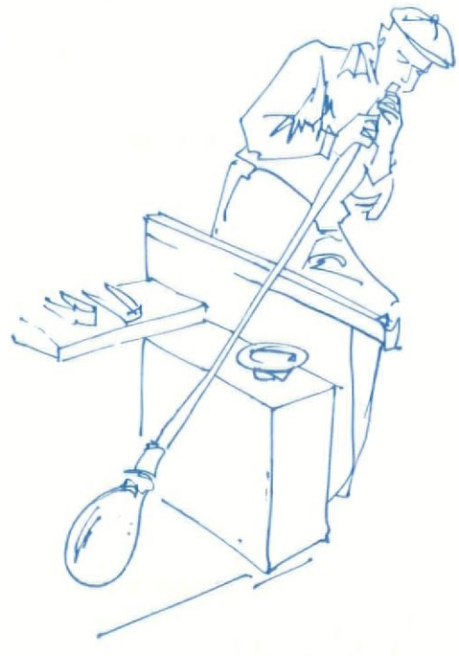
What visitors like to watch best of all is the handblower making fine Steuben crystal glass. (Steuben is the only manufacturer to have won a medal for craftsmanship from the American Institute of Architects.) Here Steuben's engineers have so arranged each furnace that the grandstand crowd can see every step in the process, starting with the "artisan" who gathers the molten glass on his blow iron, and ending with the "gaffer," (the master, boss of the crew) who finishes the delicate shaping operation with hairline accuracy.

Further back in the factory, visitors can see other demonstrations, for example the etching of designs by masters such as Picasso or Rouault by means of tiny copper wheels.

The Houghtons are interested in this chance to show the people the *basic* elements of glass making; they are also interested in studying the long-term effect on the workmen (not only the maestros) of having an audience.

Perhaps this is an industrial prototype operation. Made prosperous by mass-producing such commonplaces as light bulbs and thermometers, the Corning firm has been in position to organize this quality of work on a substantial and practical basis.

And the architects wisely added nothing to the show, played it straight.



CORNING GLASS CENTER

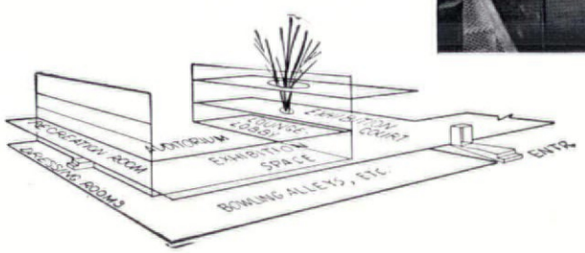
"Attitudes toward work"

←

"Attitudes toward leisure"

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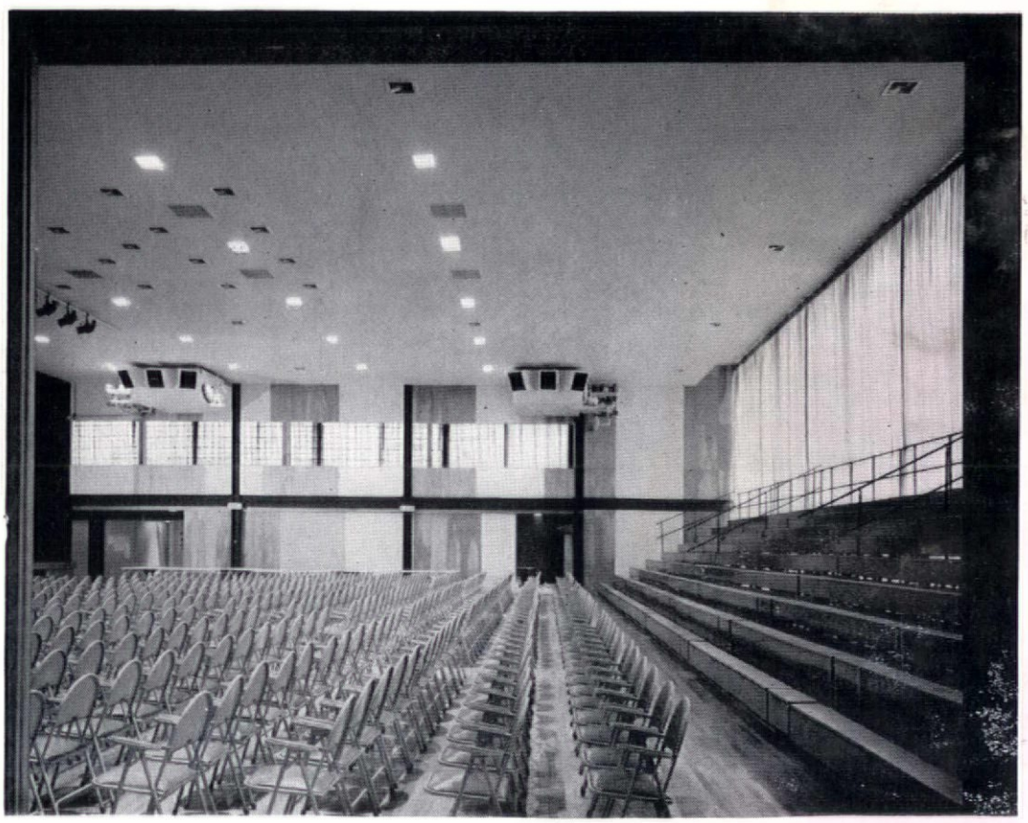




The lounge for card-playing and billiards is a sample of employee and community facilities that include bowling, outdoor sports. Diagram helps show how this lounge opens as a mezzanine to the auditorium (photo below). Note concentrated lights along centerline of auditorium to permit setting up basketball games and boxing matches.



Door at right in photo above is entrance to foyer-lounge for auditorium. Summer theater visitors like the unusually plentiful space for between-the-acts snacks. The 30' x 30' x 32' stage is ample; full fireproofing precautions are not required for the occupancy intended. Once a year the auditorium, foyer, and dressing rooms are all thrown together for a banquet given to 2,200 Corning employees.



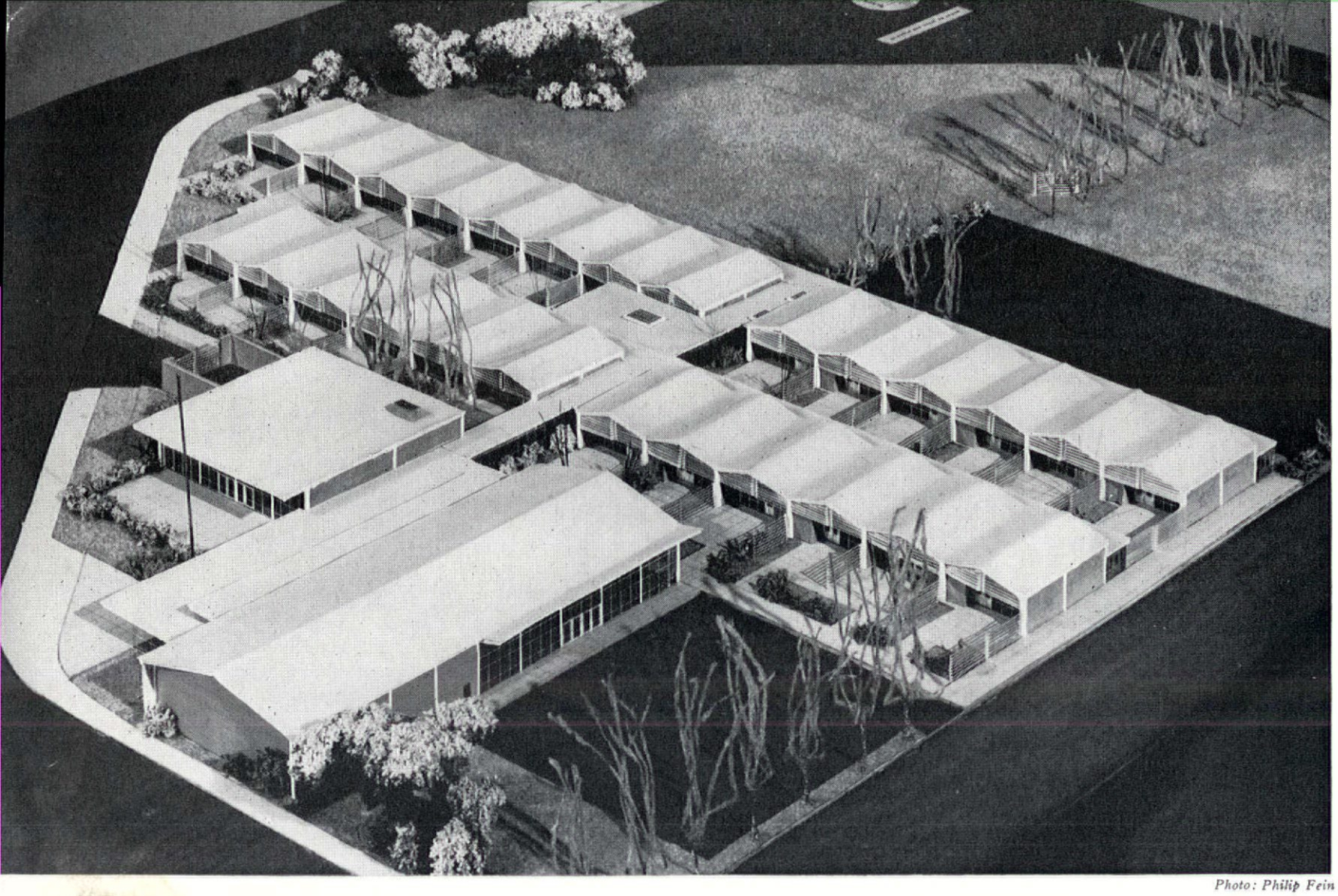


Photo: Philip Fein

STEEL-SAVING SCHOOL HAS ZIG-ZAG ROOF

Y-shaped concrete slabs separate classrooms, cut finger plan costs

LOCATION: San Francisco, Calif.
JOHN LYON REID, Architect
THEODORE M. KUSS, Consulting Engineer
DR. N. L. ENGELHARDT, Educational Consultant

Faced with high costs and the metals shortage, Architect John Lyon Reid set out to do the most economical school he could in reinforced concrete without sacrificing quality or performance. He arrived at a charming child-scale building with a zig-zag roof and a new twist in concrete construction.

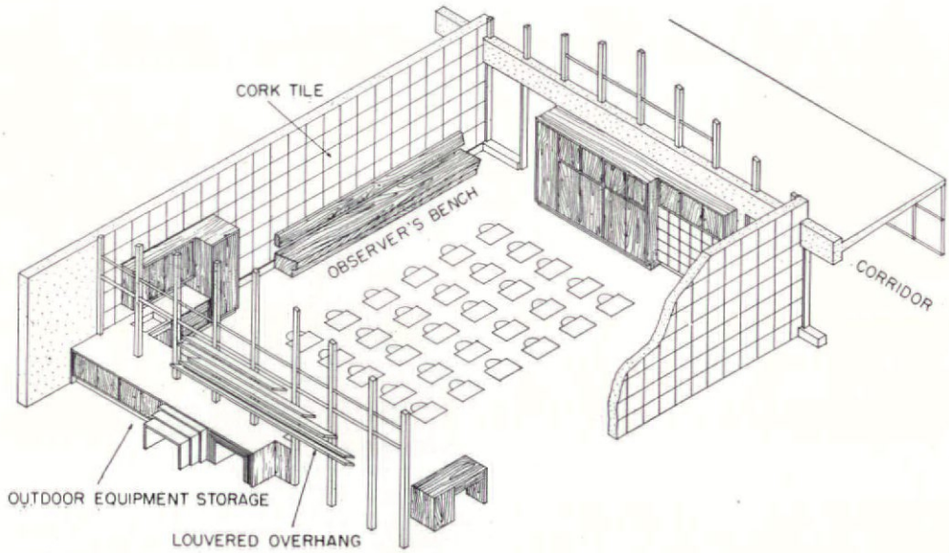
Reid's first step was to place the classrooms of his Sir Francis Drake School with their short ends instead of their long sides to the corridor.* This immediately shortened his classroom wings by one-fifth with a corresponding shortening of corridors, metal heating lines, metal electric ducts, and incidentally, walking distances. Because adjoining classrooms now shared their long sides instead of their short ones, there was also a reduction in classroom walls.

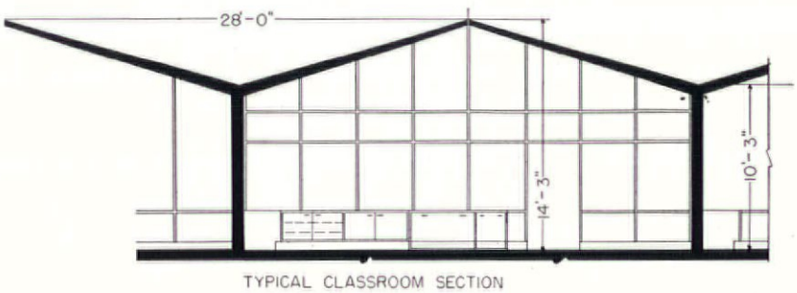
For the sake of short roof spans, Reid considered giving each classroom its own barrel vault, so each wing would have looked like a series of waves, but Engineer Kuss sliced the idea differently. Instead of thinking of each roof as a vault resting on walls, he thought of each wall as a tree-shape supporting one-half of *two* roofs by branching out at the top. (Section, opposite.) In other words, each partition wall became a prolonged Y-shaped rigid frame cantilevering out on both sides, and meeting the next frame at the ridge. This balanced construction of all but the end walls offered economies both in material and execution—every wall would be structurally independent of every other wall, the form work would be simple and repetitive, and there would be no complicated beams projecting below the ceiling because the entire slab acted as the "rigid frame."

In materials alone, Reid and Kuss estimate that their system will require 10,000 lbs. less reinforcing steel and 30 cu. yds. less concrete, saving $3,000. Because the flat slab construction produces a smooth ceiling, the designers have been able to pick up another $1,000 by substituting roof insulation for a suspended ceiling with no loss in looks.

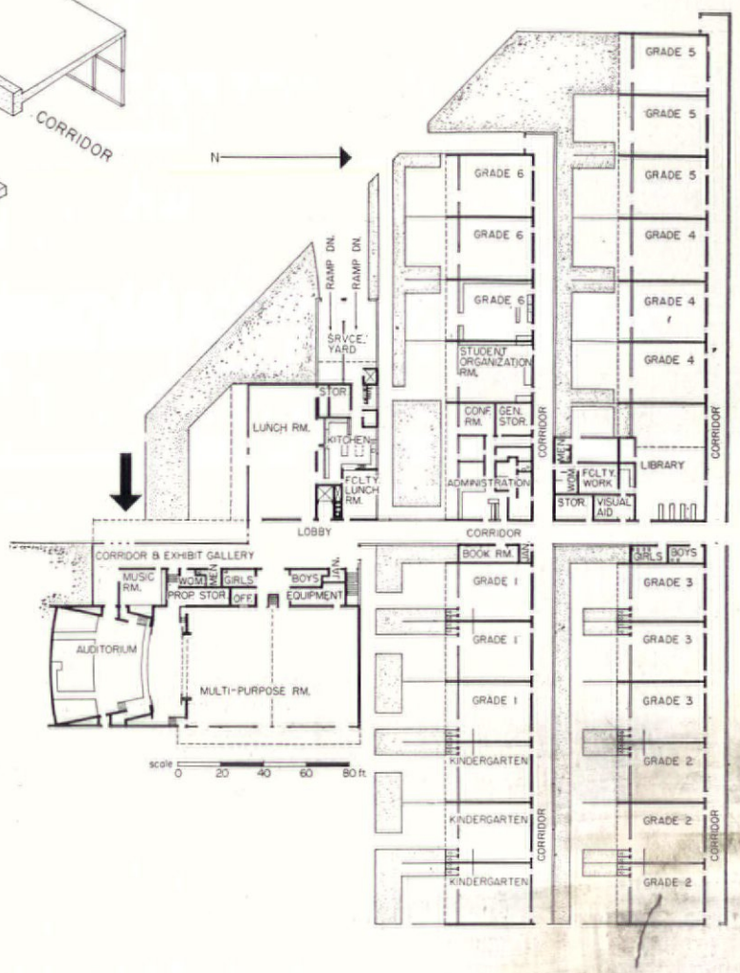
Reid exploits his basic structural savings to provide top-quality facilities—the school will serve as a model labora-

* An economy measure advocated in FORUM's *School for 1950*, see THE MAGAZINE OF BUILDING, Oct. 1949.





TYPICAL CLASSROOM SECTION



A 50 sq. ft. observer's area for student teachers is included in the 27 x 34' classrooms. (Rendering above) Since this area reduced wall space available for cabinets, counter units were provided below the south windows for storage of nesting work tables and other outdoor equipment. One entire wall will be cork tiled to accommodate large scale exhibits. Teachers will use a movable chalk and pinning board in place of normal blackboards.

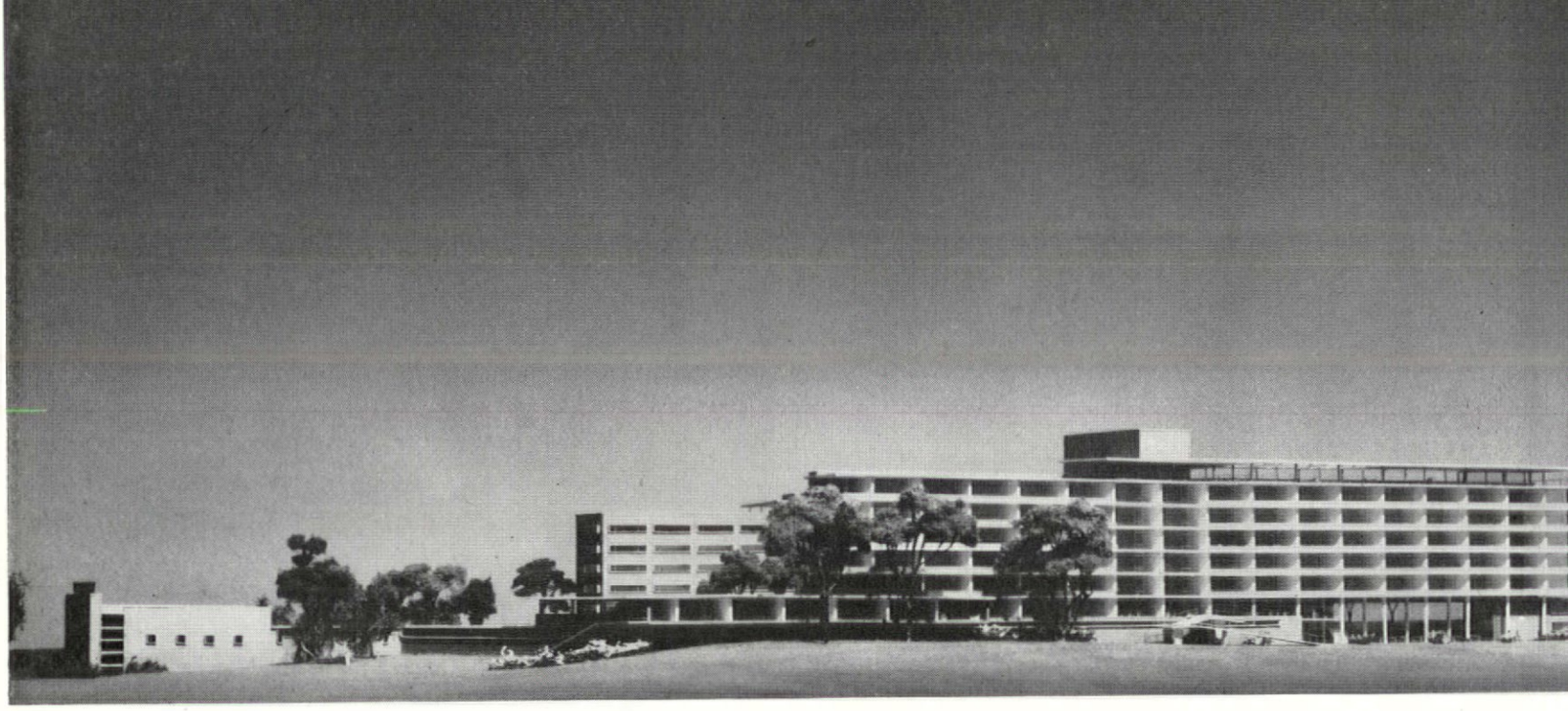
tory for student teachers of San Francisco State College. The four zig-zag roofed classroom wings branch east and west from a trunk passageway, accommodate 600 pupils in 21 rooms. Each room opens to the south on an individual outdoor area screened on each side by fences and planting. Connecting corridors on the north are glass-enclosed to give protection against fog and the cold northwest wind. Glazed gable ends let light in high on two sides of classrooms—the full story southern window is louver-protected.

Finger wings are set well back from the street to give children easy access to a playground which occupies the northern half of the five acre site. Kindergarten classrooms face a smaller playground, shielded from the wind by the assembly building and wings to the north.

Designed for both school and community use, the cafeteria and assembly building are easily accessible from the street, also act as a buffer for classroom wings. Folding, rollaway tables permit the cafeteria to be converted quickly to an indoor play space. The assembly building provides a 250-seat auditorium and a large all-purpose room, separated by a two-way stage. A folding partition makes it possible to divide the 4,400 sq. ft. all-purpose room into two areas.

At some sacrifice in public accessibility, administrative offices, faculty facilities and library are located away from the street at the junction of circulation from the four classroom wings where they will be most convenient for both staff and students.





FRIENDLY COMMUNITY HOSPITAL is designed to serve as a health

LOCATION: Overbrook, Pa.
VINCENT G. KLING, architect

"The community hospital was first a place to die. Then it became a place to get well. Now it has a new mission to help people keep well." This is the pioneering idea that permeates the handsome new $8,000,000 plant of Philadelphia's famed Lankenau Hospital.

The minute they come in the door, Lankenau's patients and visitors will find themselves in a health museum, surrounded by exhibits as attractive as those of a modern gallery or an elegant store. Here they will get lesson No. 1 in how to stay well. Groups from schools, community organizations and local industries will visit the museum, tour areas of the hospital and attend health shows in a 400-seat auditorium. Says Lankenau's Director Daniel E. Gay, "We hope that this education program will make hospitalization unnecessary for most people and banish in advance the fears of those who may have to become patients later."

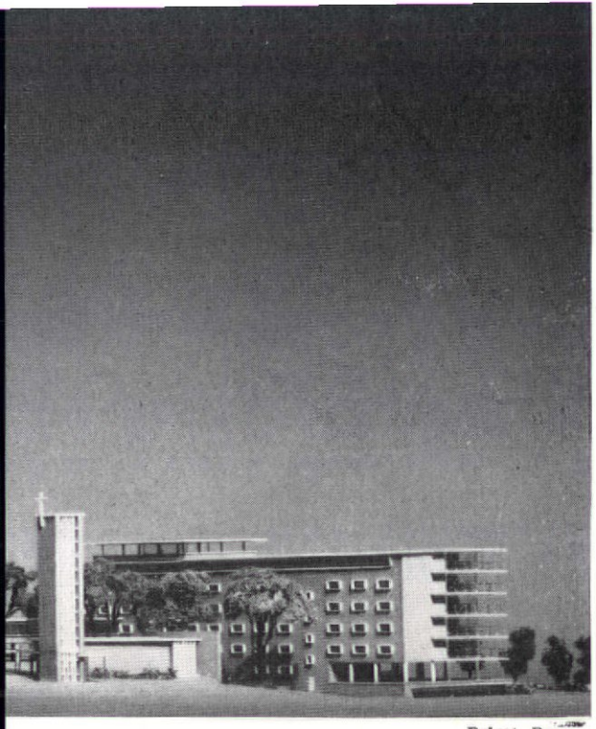
Architect Vincent Kling carries this spirit over into his clean-lined design of the buildings, everywhere reinforcing good conventional therapy with surroundings that are psychologically encouraging to both patients and visitors. His H-shaped plan of the main 320-bed hospital (opp. page) gives all patient rooms southern orientation, a distant view, and protection from the noise of entrance and service courts. By concentrating all auxiliary services in a block between nursing wing and outpatient building, he not only made them convenient to both, but achieved clean separation of different types of traffic and isolated unpleasant sights, sounds and smells. (Operating and obstetrical services are on top floors of the connecting wing). Visitors' morale will be boosted by spacious waiting rooms with a pleasant outlook, by ample parking areas, a public cafeteria and a retiring room on each floor where doctors can report on a patient's progress. A canopied roof deck, nursing floor solariums and a pitch-and-put golf course will make life brighter for ambulatory patients.

To amplify its teaching of preventive medicine, Lankenau will make it possible for people to consult non-staff doctors right at the hospital, where they will have the benefit of its specialized facilities. With offices in the outpatient building, these doctors will operate a group pay diagnostic clinic, supplementing the hospital's free clinical services. Since increasing need for costly equipment and research laboratories may pull many doctors into hospitals in the future, Kling has provided foundations and framing which can carry 50 more doctors' offices on additional floors of the outpatient wing.

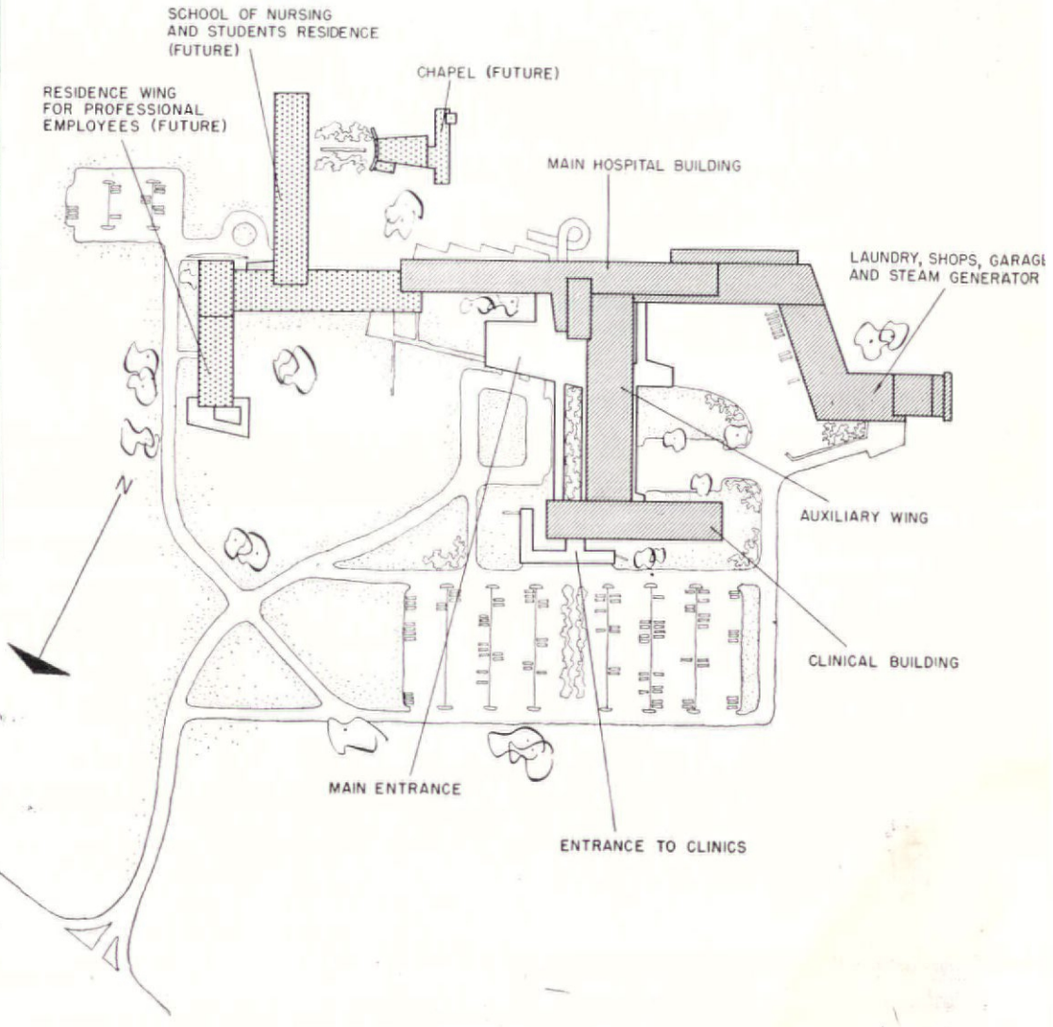
The dominant theme of friendliness to the community is expressed also in Kling's plan for future hospital expansion. Blessed with a 93-acre golf course site, surrounded by a fine residential area, the main buildings will be placed on a central high point, screened from nearby houses. Lower nurses' residences and research units will be added later. (Nine holes of the former golf course will be kept open for the staff and adjacent property owners). A high velocity discharge power plant will eliminate a tall stack, help make the hospital as much at home in the neighborhood as a superior apartment house.

Though few architects planning a community health center will have the advantages of a site like Kling's, his skillful combination of educational, psychological and medical ingredients is worth emulating. Clearest evidence of the popular appeal of this type hospital is Lankenau's success in fund-raising—without recourse to the Government. By selling the idea of full community service in one of the nation's fastest growing residential areas, Lankenau got nearly $5,000,000 through voluntary contributions, borrowed the $3,500,000 balance from banks.

Kling's layout of nursing floors combines amenities for the patient and good working arrangements for the staff. Rooms have a maximum of four beds each, look out to the south

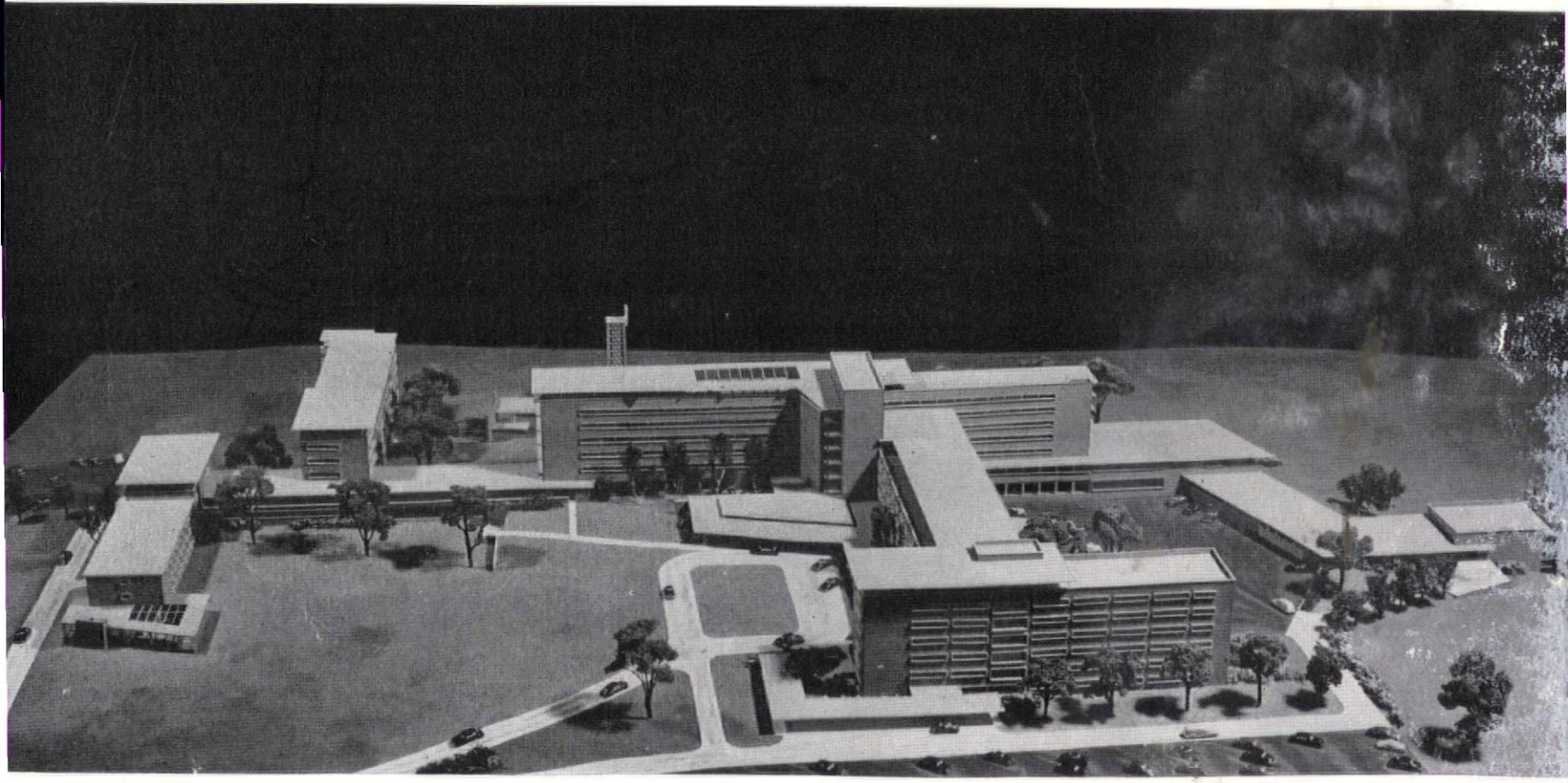


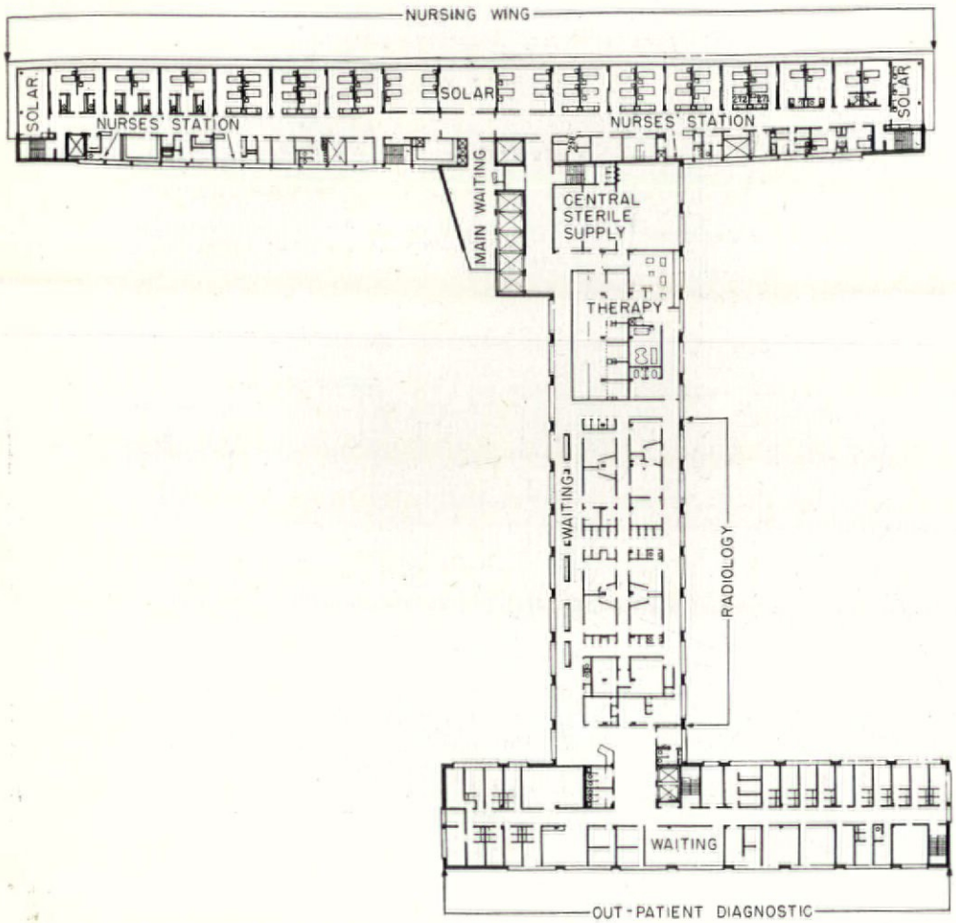
Robert Damora



enter for both the sick and the well

Seen from the south, Lankenau's main nursing wing (above) has the cheerful quality of a top resort hotel. Model and site plan show future chapel, school of nursing and residence for professional employees. Kling will substitute flush sash for projecting window surrounds shown on model.

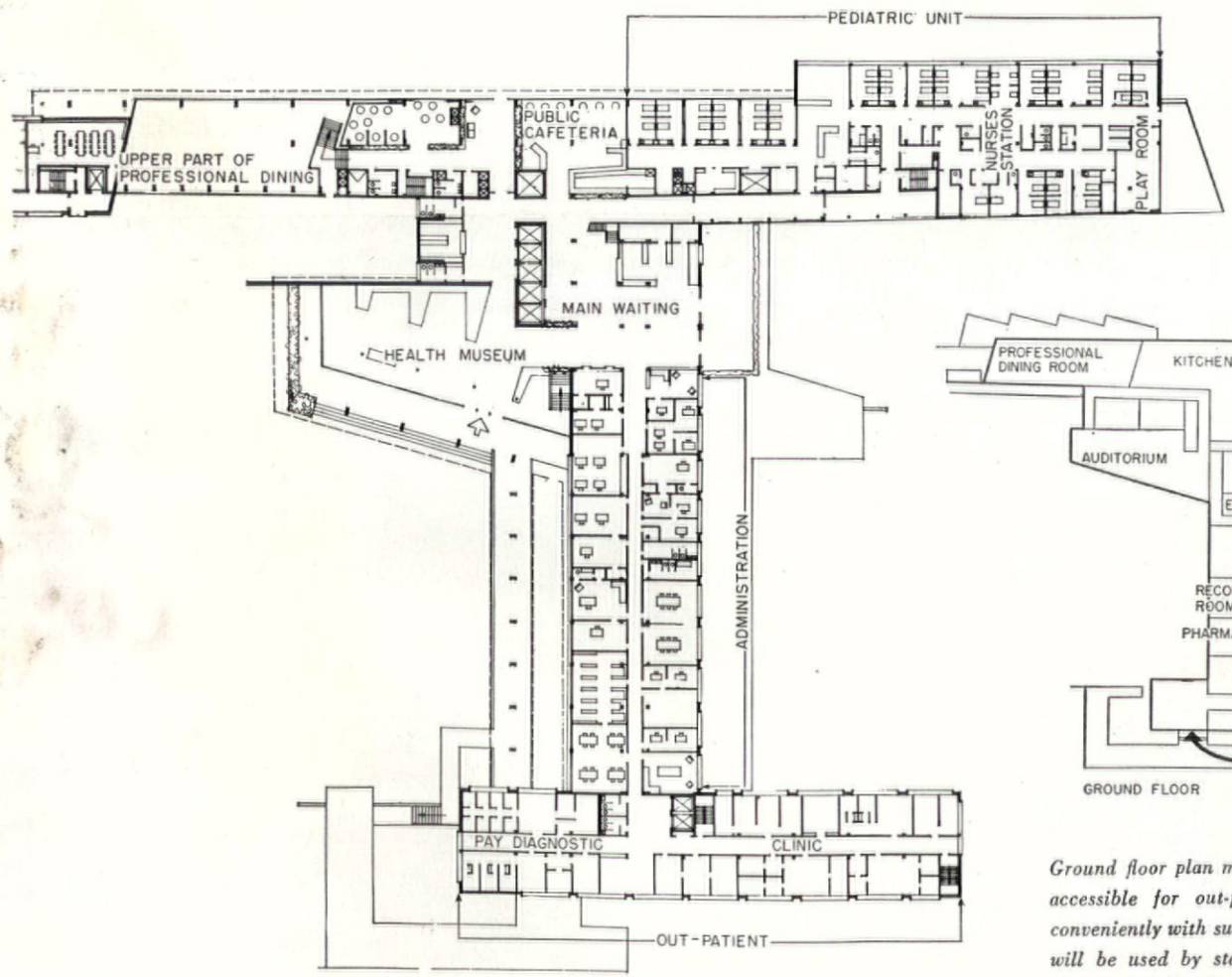




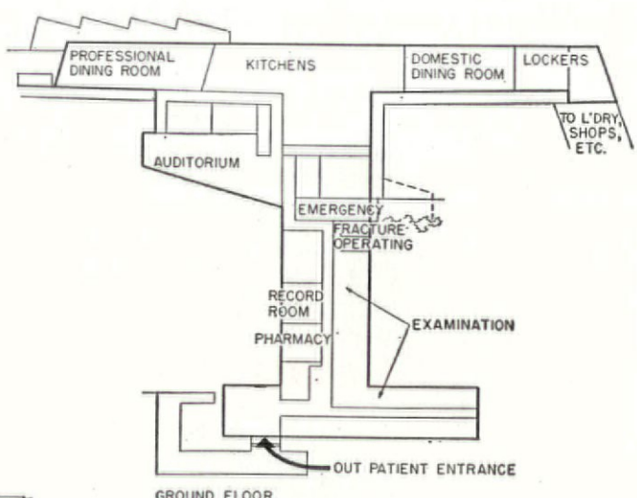
SECOND FLOOR

Plan of second floor shows how Architect Kling separates different types of traffic and caters to comfort of patients and visitors. Island of x-ray and therapy facilities in the connecting wing is surrounded by outside corridors which provide waiting space with a view for out-patients and protected access to treatment for in-patients. Elevator bank is removed from nursing corridor, has opposite-facing service and passenger cars.

Community service is spelled out in large first floor areas of health museum, public waiting room and cafeteria, cloak room, administration and records section. To gain spaciousness, staff dining room is made two levels high, and main waiting space flows into a gift shop and out to an open air terrace. Note excellent layout of pediatric unit with easy access to the grounds.

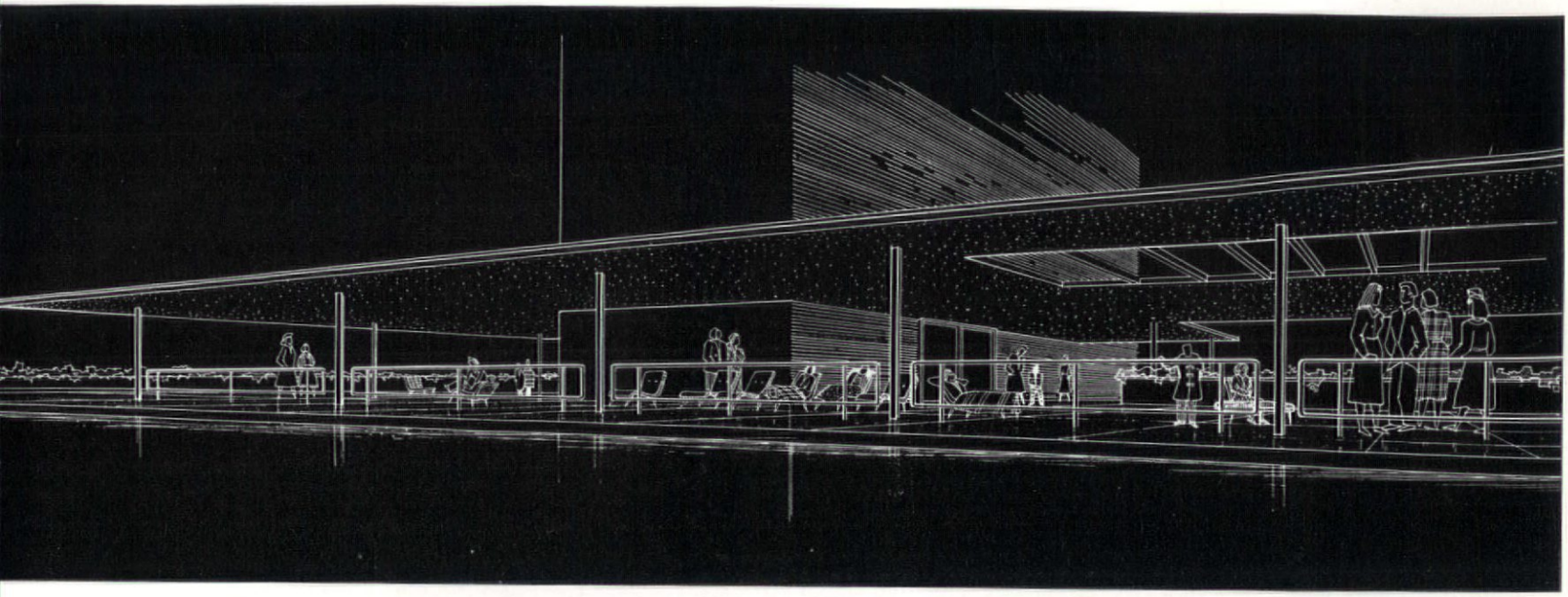


FIRST FLOOR



GROUND FLOOR

Ground floor plan makes drug supply and records easily accessible for out-patients, links emergency facilities conveniently with surgery examination rooms. Auditorium will be used by staff and patients as well as by civic groups attending health lectures.



Slim canopy over the nursing wing's roof deck is an effective foil for the large mass of the elevator tower, provides a choice of sun or shade for patients.

through continuous ceiling-high windows shaded by wide overhang (plan, left). Kling keeps sills low to give bed-ridden patients a view, thinks that overhangs will prevent ambulant patients from feeling insecure near windows. Private rooms have individual toilets; others have stacks for future toilets.

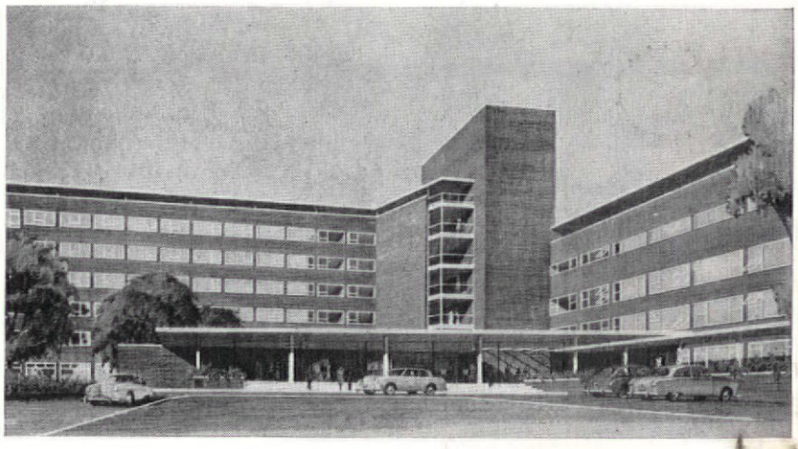
To reduce noise and traffic outside rooms, the main elevator bank is located off the nursing wing corridor. Three passenger elevators open on a spacious waiting and control area; two service elevators open in the opposite direction on a closed corridor linking nursing floors with adjunct facilities. This arrangement also keeps visitors from seeing patients being moved from rooms to treatment areas.

Typical of Kling's design refinement is the main nursing wing corridor which widens out toward the center part. This provides more space where traffic is heaviest, gives nursing stations a better view up and down the corridor and creates the optical illusion of a shorter, more intimate area.

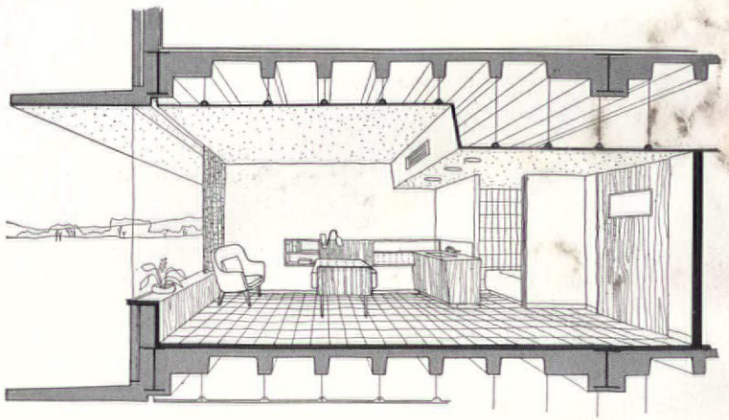
Nursing stations, utility and treatment rooms are on the north side, have good natural light and ventilation. Good nursing care is assured by holding the number of beds served by one station to 26 and limiting the maximum run from stations to 78′. Nurses' work is also lightened by tray conveyor delivery of food and return of dirty dishes.

In addition to efficient working arrangements, the staff will have pleasant facilities for off-duty hours. (Says Kling, "The spirit of a hospital is no happier than that of its staff.") Among them are a two-story, glass-walled dining room for all professional employees, a private dining room for top staff, a sheltered roof deck for internes living on the top floors of the outpatient building, and a nine-hole golf course.

Buildings will have a steel frame, concrete joist floor system, Roman brick skin and aluminum windows. Contract cost of the total project, including land, fees and all equipment, is $18,000 per bed—a figure which compares favorably with the cost of many conventional general hospitals now under construction, despite Lankenau's special features. Besides features mentioned, these will include larger than average facilities for surgery and research to permit the hospital to expand its tradition of outstanding work in these fields.



Arresting composition of the low, glass-walled health museum, a tier of waiting room windows and the big elevator tower makes the main entrance a pivot point for the whole plan of the hospital.



Architect Kling envisons this type of de-luxe private room and bath in nursing floors which may be added later. Heating and cooling ducts will be housed above suspended ceiling.

FIRST MODERN U. S. CIVIC CENTER



Clyde Sunderland

LOCATION: Richmond, Calif.

MILTON H. PFLUEGER and TIMOTHY L. PFLUEGER (1892-1946), Architects

ELMER J. FREETHY (City Hall and Hall of Justice)

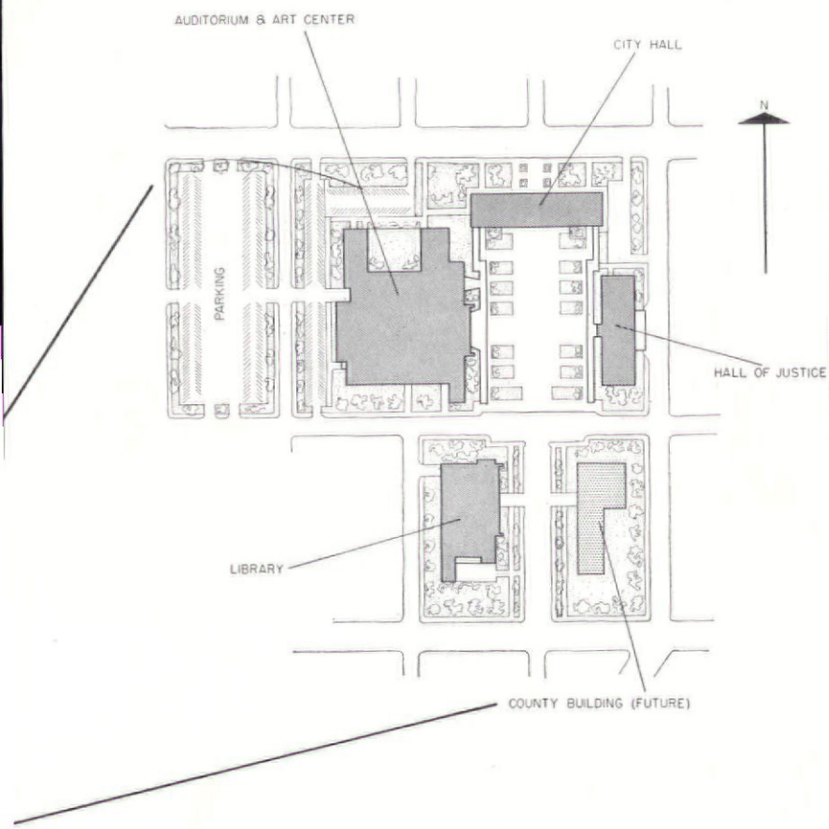
PARKER, STEFFENS & PEARCE (Library)

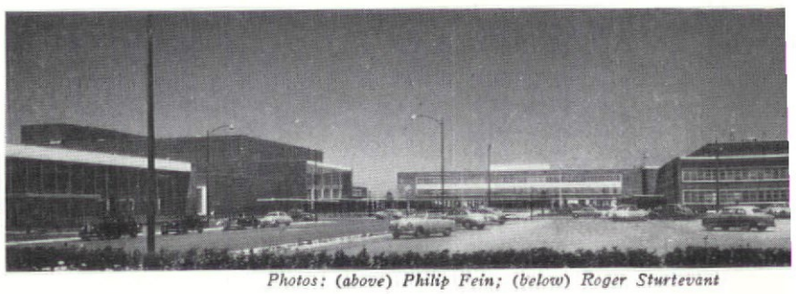
CLINTON CONSTRUCTION CO. (Auditorium and Art Center) General Contractors

HUBER & KNAPIK, Structural Engineers

ATKINS & MAGGIO, Mechanical and Electrical Engineers

H. LELAND VAUGHAN, Landscape Architect



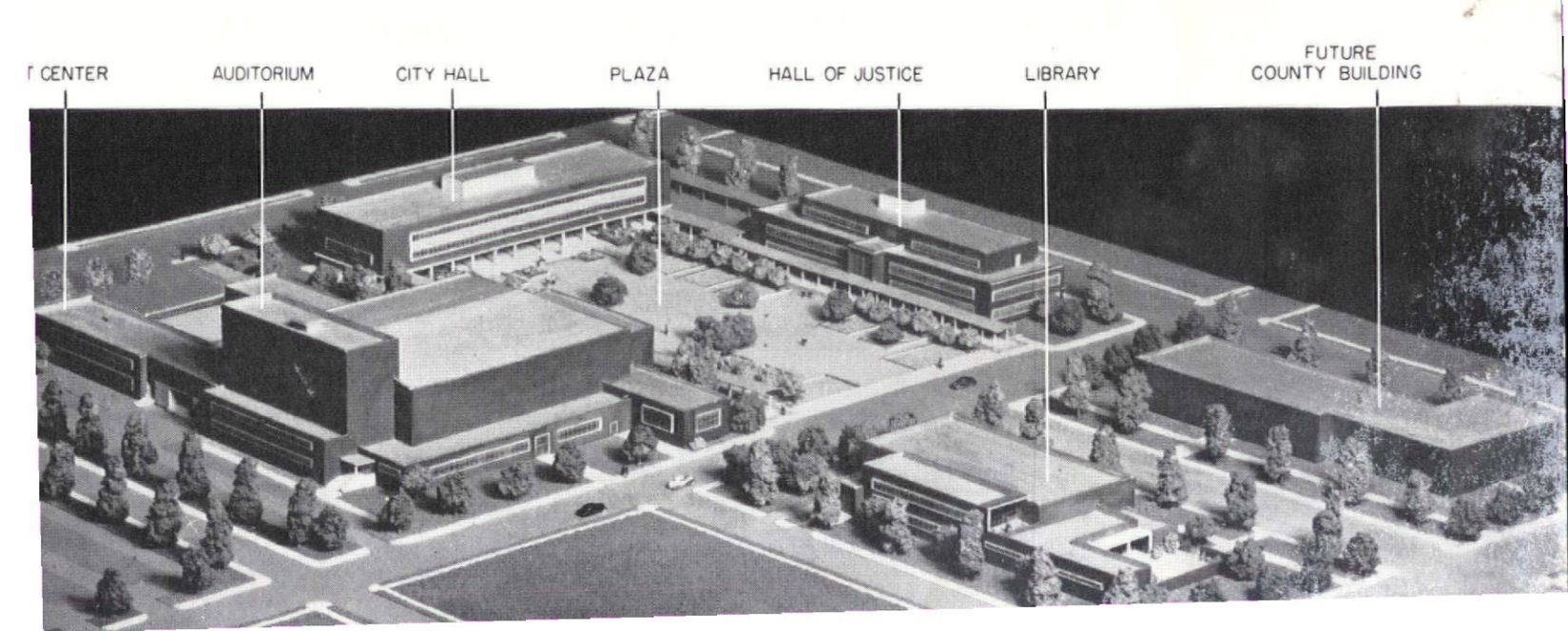


Photos: (above) Philip Fein; (below) Roger Sturtevant

The new Memorial Civic Center in Richmond, Calif., is a milestone in U. S. civic design; it is the first modern Civic Center built in any American city; and it is one of the most comprehensive modern Centers constructed anywhere in the world.

The men who designed the Center—Milton Pflueger and his late brother Timothy—took six city blocks, combined them into a superblock with a landscaped plaza in the middle and grouped four large buildings around it. These are the City Hall, the Hall of Justice, the Auditorium & Art Center and the Library. A fifth building—the County Building—will soon be added to the south.

Richmond's happy citizens call their Center "majestic" and "magnificent." Visitors from other American communities are likely to be more sober in their reactions, may ask how the city could afford to build it, how smart it was to build the Center as a complete unit, and how much the Center contributes to making Richmond a better place to live in.



Boomtown, U.S.A.

The reason Richmond built its Center is that Richmond couldn't afford *not* to build it. From a sleepy little factory suburb of San Francisco (with a 1940 population of 23,000) Richmond exploded into one of the busiest arsenals of the U. S. war effort when Henry Kaiser hit town, built four gigantic shipyards and brought in 90,000 men to operate them. When the shooting was over, Richmond had 106,000 inhabitants to make feel at home.

The Civic Center was a major answer. A bond-issue ($3,850,000) was voted in 1945 to build it; relatively cheap land in a residential area one mile east of downtown Richmond was bought up by the city; and by the fall of 1949, the first buildings had been completed.

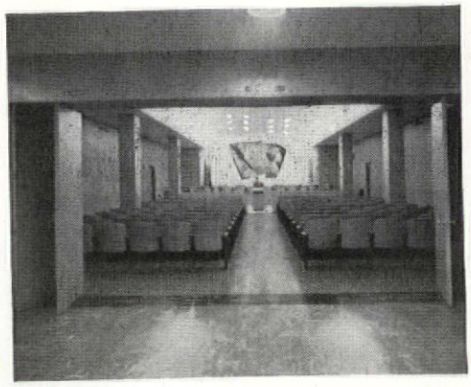
Increasing costs had boosted the initial estimate to a $4,210,000 total (incl. furnishings, equipment, landscaping but not land or fees). The difference came out of the city general fund, was much smaller than rising building costs had led the city to expect.

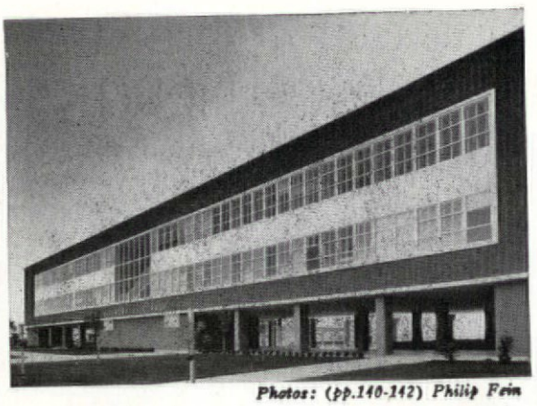
Other American cities will be encouraged that Richmond found it possible to locate its Center way *off*-center in a residential area, where land-costs are substantially lower and where through-streets can be blocked much more easily than in the hearts of downtown areas. Because downtown Richmond is only a mile to the west and is rapidly moving east, Richmond's Center may soon be swallowed up in the expanding business area; but even if it is not, present experience shows that its administrative and cultural functions will not be impaired by the off-center location. This is excellent news for other American cities whose Civic Center plans have been stymied to date by high land costs in their downtown areas, and whose city fathers have hesitated to move the government to an outlying district. Richmond proves that it can be done.

Superblock

The Richmond Center covers 15 acres, takes up six city blocks. In developing this big chunk of land all at once, the Pfluegers confirmed certain advantages long predicted by city-planners:

- With through-streets blocked, the heart of the superblock could be turned into a spacious plaza reserved for pedestrian traffic under continuous colonnades; and parking areas could be located on the periphery;
- The plaza itself could become an additional outdoor room, suitable for concerts, rallies and other gatherings;

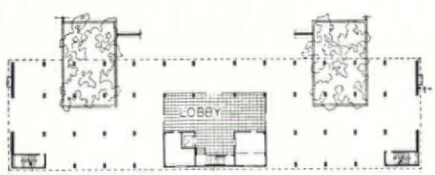




Photos: (pp.140-142) Philip Fein



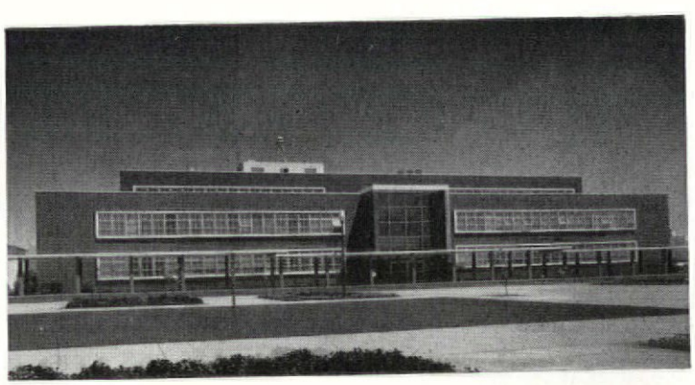
THIRD FLOOR



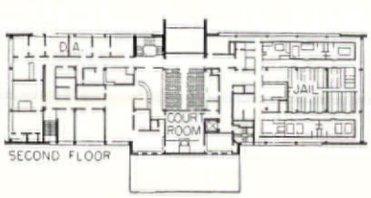
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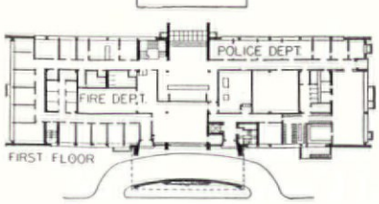
CITY HALL and Hall of Justice (below) were built together, cost a total of $1,687,000 (including furnishings & equipment). To give it added importance, City Hall was raised up on stilts. First floor is therefore completely open except for lobby area, and visitors can approach lobby from all sides or walk under the building into the plaza or to Barrett Avenue to the north. Second floor contains offices of Finance and Public Works Departments. Third floor has Council Chamber and Department of Public Health. Frame (as in Hall of Justice) is reinforced concrete set in regular bays.



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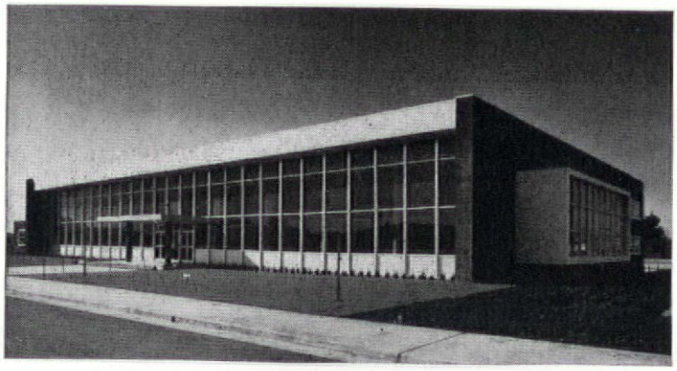


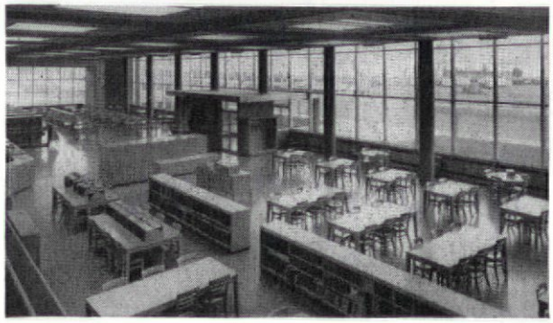
SECOND FLOOR



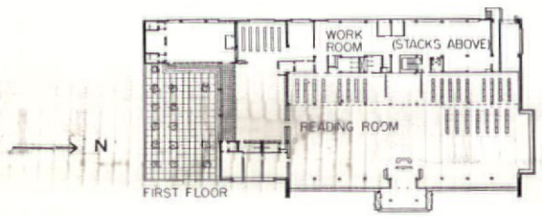
FIRST FLOOR

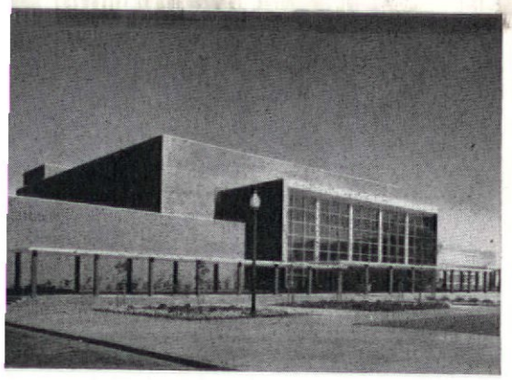
HALL OF JUSTICE is three-story structure housing City Court, Police Department and administrative headquarters of Fire Department. Court Room is in center portion of second floor, jail is to its north, Judge's Chamber and D. A.'s offices to its south. Third floor contains gymnasium and classrooms for police force (principal Police and Fire Department offices are on first floor). Like the City Hall, the Hall of Justice was completed in September of 1949. It contains a boiler plant serving the entire Center.

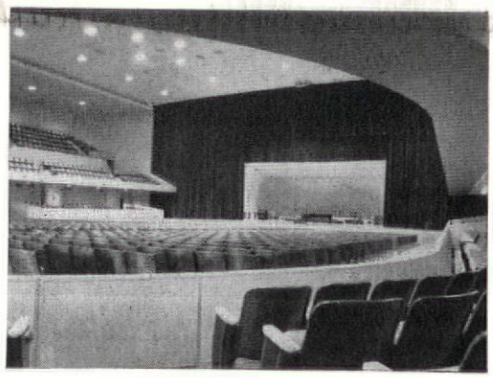




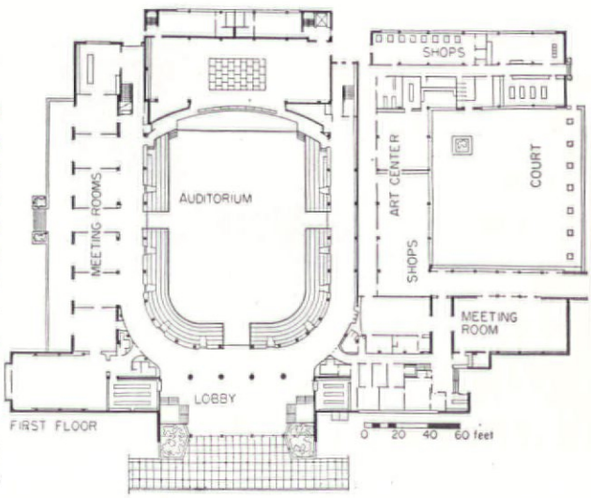
LIBRARY has two-story reading room 55' by 150' behind glazed east facade, periodicals and stacks on a mezzanine above work space. Like the Auditorium & Art Center it was framed in steel and concrete. Total cost (including equipment) was $576,000 when completed in December of 1949. Program for this building was written by noted Richmond librarian Colt Coolidge, who felt that the main reading room should encompass all library functions, including storage, charging and delivery facilities. Capacity of library is more than 100,000 books.







AUDITORIUM & ART CENTER building is largest of group, contains theater with 3,850 seating capacity designed for flexible use including sports, dancing and arena productions (when main floor is adjusted to level position), in addition to traditional stage plays. To the north of Auditorium is the Art Center with workshops, classrooms and exhibition galleries grouped around interior garden court. Other facilities are musicians', team and chorus rooms, dressing rooms, meeting rooms and ballrooms, as well as a grand lobby 96' x 36' and 36' high. Cost of building was $1,947,000 when completed in April of 1951.



▸And the whole group could be turned into a coherent architectural unit.

The superblock arrangement thus makes the Civic Center as convenient as any modern suburban shopping center designed to serve people who come to it by car from outlying areas. All the facilities of the city government are concentrated within one compact area; all major cultural activities of the community take place within a few hundred feet of each other. Finally, all the rallies, memorial services, etc. that cities like to go in for can take place in the heart of the city's cultural and administrative life.

Monument

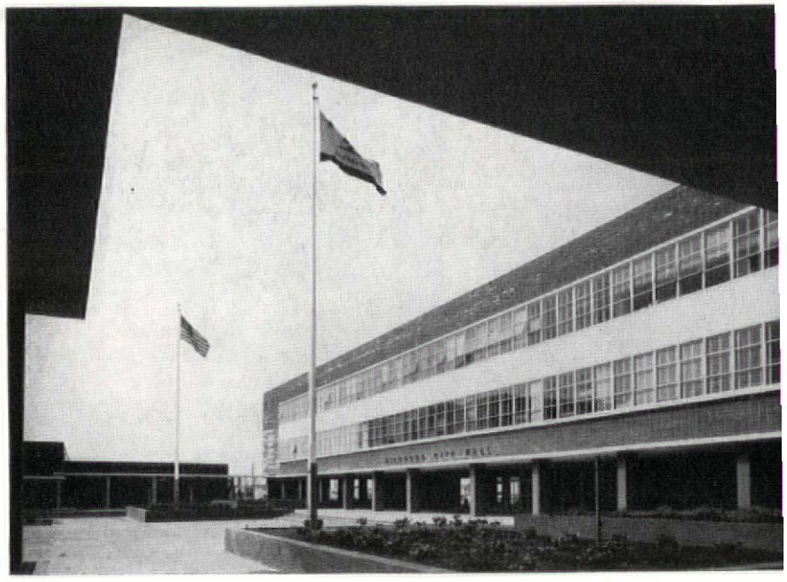
The reason Richmond needed its Center so badly was that a town that increases its population 4½ times in seven years is in danger of falling apart. How well, then, does the Richmond Center work as a civic symbol that holds the community together?

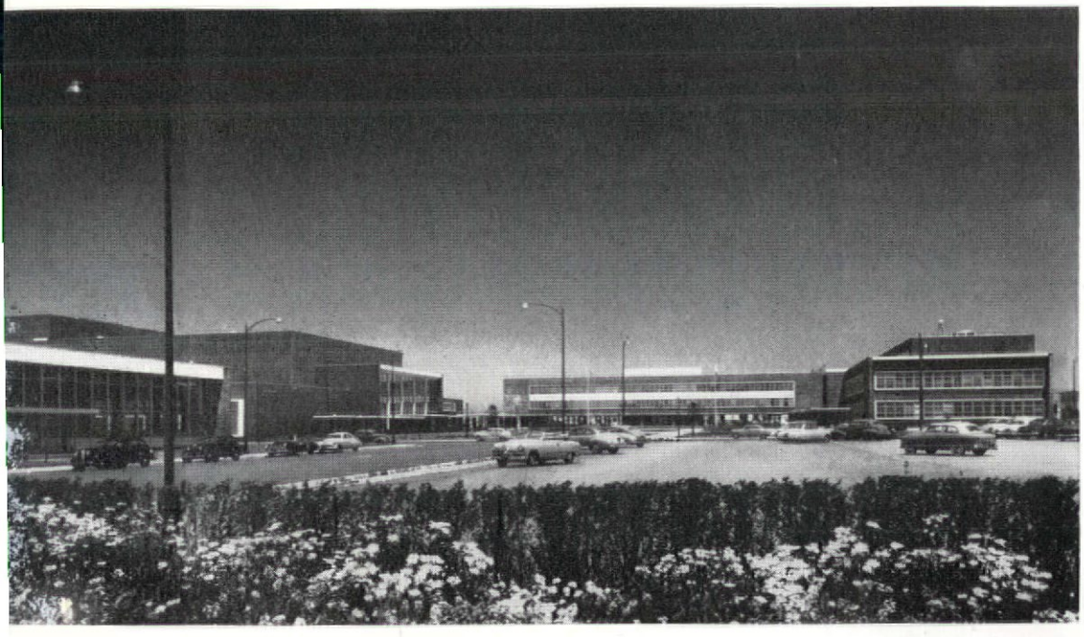
The answer is that it works fine. The symbol Richmond got in addition to four large buildings is the plaza in between them. That plaza is about as big (though not as coherent) as the Piazza San Marco in Venice, is surrounded with colonnades designed to shelter pedestrian traffic. These colonnades are the main unifying device that pulls together a group of buildings of very different scale, size and function.

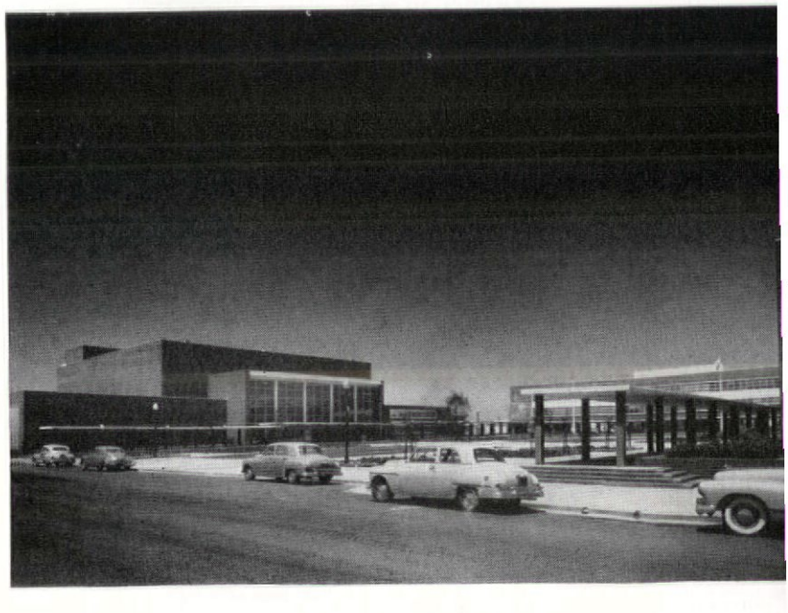
Supposing the Richmond plaza were to be considered as an outdoor room, then the uniform facades of 12″ red brick, glass and aluminum sash are the walls; and the horizontal line of the colonnades is the chair-rail. The focal point of the area is the City Hall, raised up on stilts to make it look more important.

The problem the Pfluegers faced in their "outdoor room" lay in the great differences in size, function and scale of the buildings that surround it. Had they all been like the City Hall the solution would have been simple. But unfortunately they were not: The biggest was a 3,850 seat Auditorium—a huge building that might have made an ideal focal point in the Center but for the fact that, symbolically, the City Hall was more important. Another was a 100,000-book Library only one quarter the size of the Auditorium building, but located next to it for functional reasons.

In view of these differences in size and scale some architects may ask whether the Pfluegers didn't make things unnecessarily hard for themselves by sticking to a near-symmetrical layout, by treating their few buildings as separate structures (rather than as components of a single room), and by







trying to produce a rather forced near-symmetry in some of the individual buildings. Perhaps the standard "modern" solution would have been deliberately asymmetrical. Such a solution might have produced an even greater sense of calm repose than that which now pervades the Center.

To have achieved such sincerity and repose in the face of scale and balance problems is the Pfluegers' greatest contribution. They did it with uniform materials, with the unifying white horizontals of the colonnades and by keeping out vehicular traffic. To every American city looking for a modern way to consolidate its administrative and cultural resources, the Pfluegers set an example that will surely be envied by many, copied by some and developed further in the coming years.

EASY MONEY IN REAL ESTATE

Some unforeseen effects of the excess profits tax and how to take advantage of them

By J. K. Lasser

If you know all the options the law contains about your excess profits tax credits, the U. S. Treasury may help you pay the rent on your plant, meet the interest on your mortgage, and do many other queer things that will almost certainly spell inflation in real estate prices. In the crazy economy of 23-cent dollars set up by the excess profits tax, one way to get rich may be to study the elections and alternatives in the tax law—and in real estate they are particularly tempting. Smart investors have already figured a dozen ways by which otherwise unprofitable real estate deals can be set up to get advantages the law permits. Herewith a study by America's most famous tax consultant:

Today's tax program may have a highly inflationary effect on real estate. By the erratic impact of the excess profits tax, we may already have:

- Entered a period in which this tax will govern all intelligent business moves.
- Created a supply of very cheap money for the already well-financed.
- Stimulated real estate sales and real estate borrowing—because such transactions can be used to cut excess profits tax liability.

Here is the crazy-quilt pattern of corporate tax rates today:

25% on net income up to $25,000

47% from $25,000 to the amount of excess profits credit

77% on all income between the excess profits credit and an amount equal to twice the credit plus $18,333.33

62% from that point on up

The best way to increase after-tax profits is to boost the excess profits tax credit. Without getting into the whole of detail needed to get the best credit, your tax expert will tell you that *generally* the credit will be arrived at in two ways: 1) it can amount to 85% of a corporation's average profit for the best three years between 1946 and 1949; or 2) it can amount to 12% of the total capital invested in the business. Equity capital invested counts 100%; borrowed capital invested counts 75%. The first of these alternatives may be hard to change, but the second method of computing the EP credit offers many opportunities as we shall see.

Naturally a lot of business decisions turn on when a company gets into the 77% bracket and when it passes over into the 62% ceiling rate. When a company gets into the 77% zone, it is a good gamble to spend on new projects (including new building) to get up into the 62% zone. But it may be a bad gamble for a company in the 25% or 47% zone to risk money to increase its income. Here are the tax odds when a borderline company spends $1,000 to earn $1,000:

25% corporation risks $750 to earn $530—odds 1 to 1.4

47% corporation risks $530 to earn $230—odds 1 to 2.3

77% corporation risks $230 to earn $380—odds 1.65 to 1

Borrowing at no cost

Expansion of business borrowing is condemned as inflationary. But the excess profits tax turns the cost of borrowing (on notes or mortgages) into a profit if the borrower is in the 77% excess profits bracket. This is partly because the excess profits credit is increased by 12% of 75% of the borrowed money, and partly because 25% of the interest paid can be deducted in computing excess profits income. Here's how it works out on a 4% note for $10,000:

The gross interest cost is $400

Saving the 47% normal tax on this $400 offsets $188

Saving the 30% excess profits tax on 12% of 75% of the money borrowed offsets $270

Saving the 30% excess profits tax on 25% of the interest paid offsets $30

These tax savings add up to $488. This is $88 more than the interest cost. In other words, the borrower gets the use of $10,000 for $88 a year less than nothing.

For most companies in the 77% bracket, the net cost of new borrowing at different interest rates will turn out to be as follows:

If interest paid on borrowed capital is		Actual rate of interest cost for borrowing
1 %	minus	2.25 %
1 ½ %	"	2.02 %
2 %	"	1.79 %
2 ½ %	"	1.56 %
3 %	"	1.34 %
3 ½ %	"	1.11 %
4 %	"	.88 %
4 ½ %	"	.65 %
5 %	"	.43 %
5 ½ %	"	.20 %
6 %	"	.03 %

Real estate vs. stocks

If a corporation increases its holdings of common stocks or tax exempt bonds, this will reduce its EP

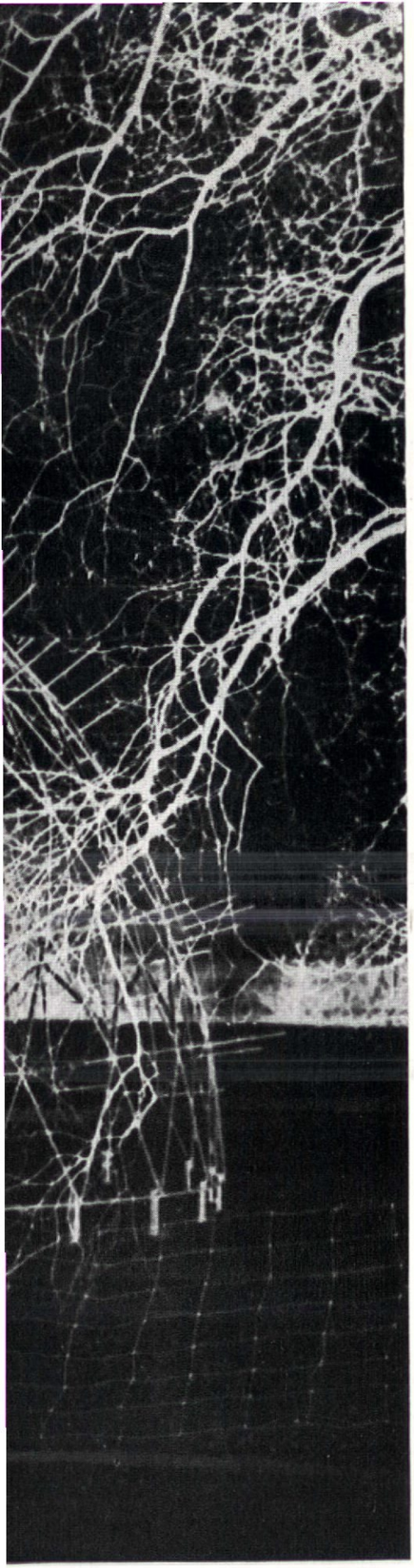
(Continued on page 232)



GEODESIC DOME

Bucky Fuller's spidery new framing system

will roof a cubic foot and support 7 lbs. with each ounce of structure



The first time you look at this skeletal dome you see the structural framework of a weatherbreak designed to be:

→ flown to its site in short struts which pack into a bundle 2′ x 4′ x 5′

→ easily erected by unskilled labor *fast* (in 45-man-hours)

→ able to withstand wind velocities up to 150 miles per hour (complete with plastic skin) and resist slam loads at velocities up to 200 miles per hour

→ completely demountable and reusable

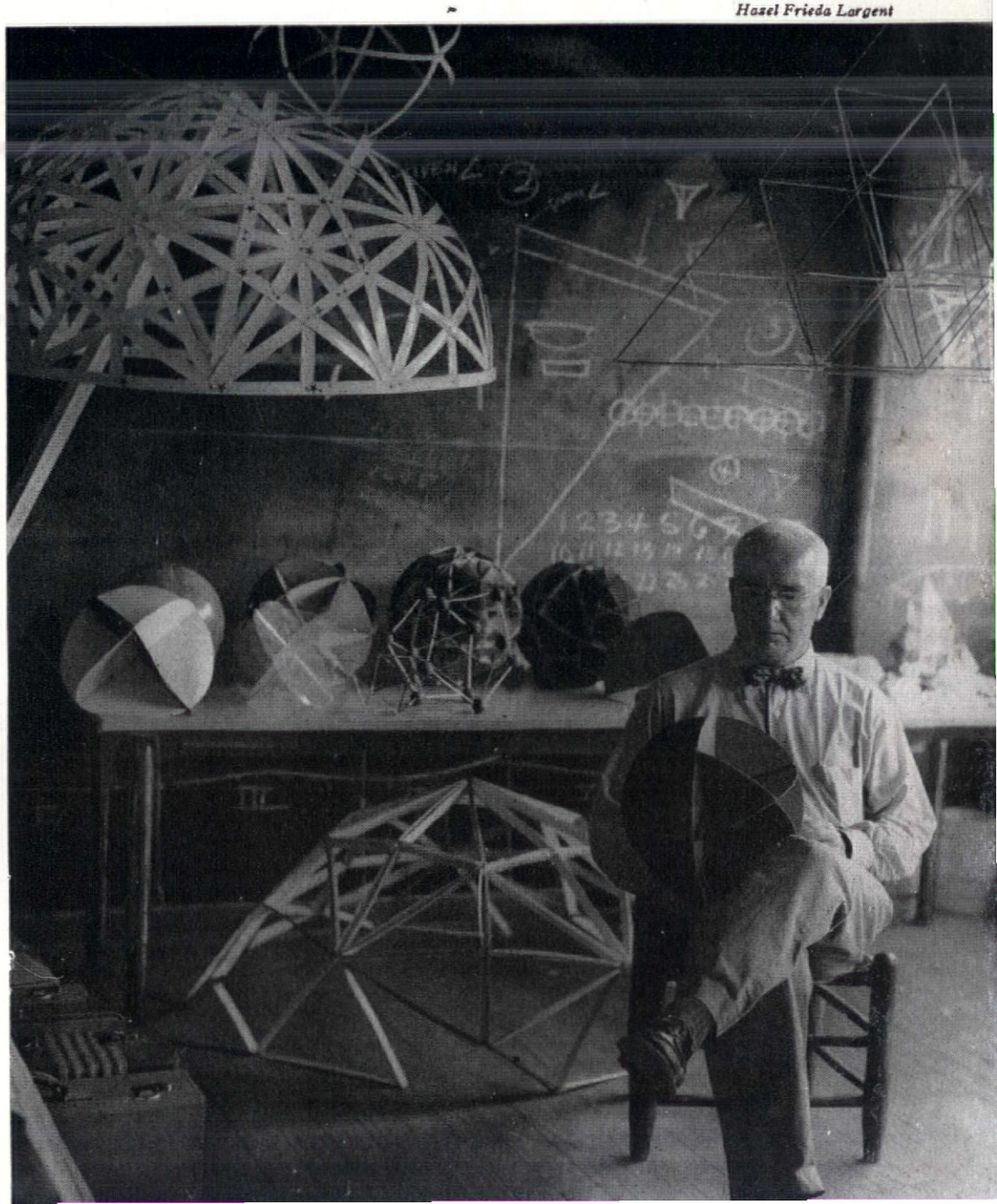
→ inexpensive—$3 per sq. ft. of covered area

Look again and you see Technology in building. One of the *things to come* has come—this design represents the highest practical point so far attained in the skeletal enclosure of space. The easily manufactured aluminum arms can be joined together in standard patterns to form domes which have clear spans today up to 800′, or in several layers for stiffening miles. Its efficiency is as beautiful as its silhouette . . . a good index to the performance of any building frame is the structural weight required to shelter a square foot of floor from the weather, and in conventional wall and roof designs, the figure is often 50 lbs. to the sq. ft. This design does it with .78 lb. per sq. ft.

The dome pattern, simply built, is the product of some very sophisticated geometry. It sprung out of Richard Buckminster Fuller's blunt forehead in the form of his personal philosophy and science, Energetic Geometry, and is expressed structurally as a discontinuous 3-way grid which stresses its members equally, and acts almost as a membrane in absorbing and distributing loads. Fuller, who has been startling staid technical men most of his life, has earned grudging praise even from the staidest for brilliant developments which up to now have not been timed right for a hammer-and-nail building technology. But here is one product of his geometry which will be very difficult to resist.

All photos copyright Fuller Research Foundation

Hazel Frieda Largent



The 8C270 WEATHERBREAK:

Outside diameter	*49.0′*
Clear span inside diameter	*43.0′*
Over-all height	*24.5′*
Clear floor area	*1,450 sq. ft.*
Dome surface area	*2,900 sq. ft.*
Enclosed volume	*20,815 cu. ft.*
Dismantled shipping volume	*40 cu. ft.*
Weight of frame	*1,000 lb.*
Weight of skin (orlon)	*140 lb.*
Total	*1,140 lb.*

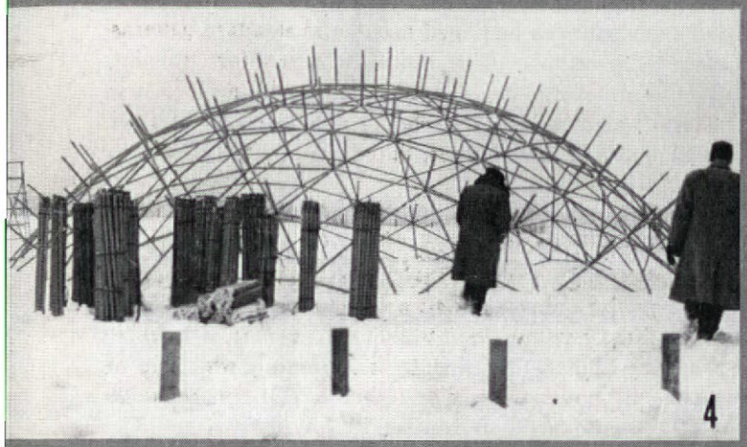




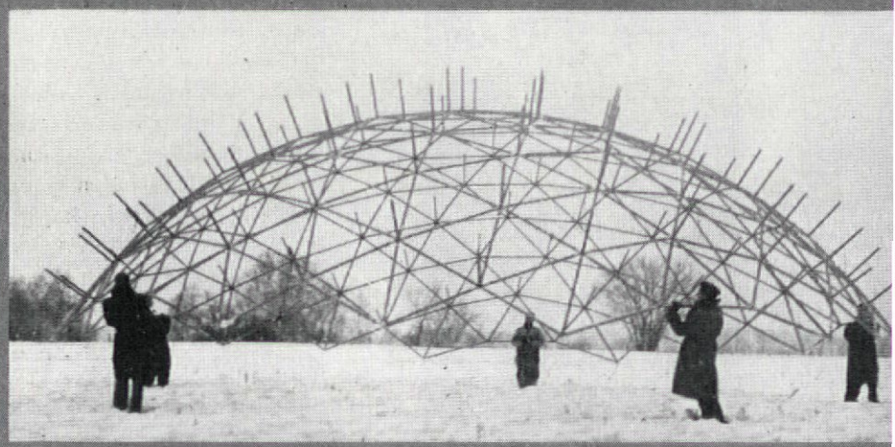
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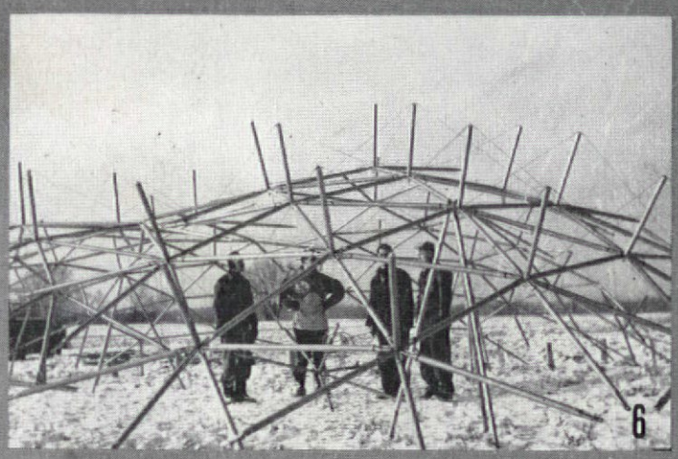


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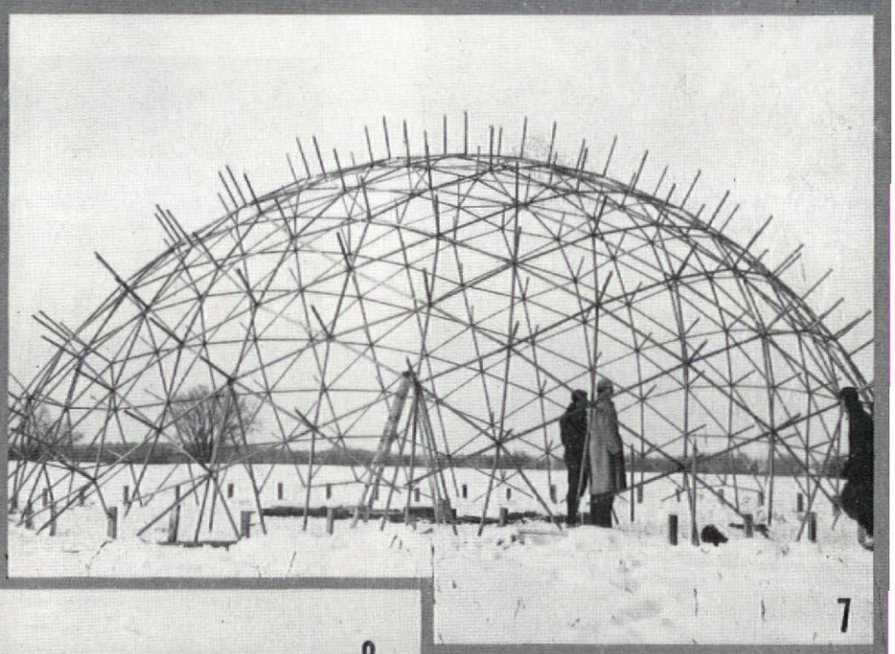


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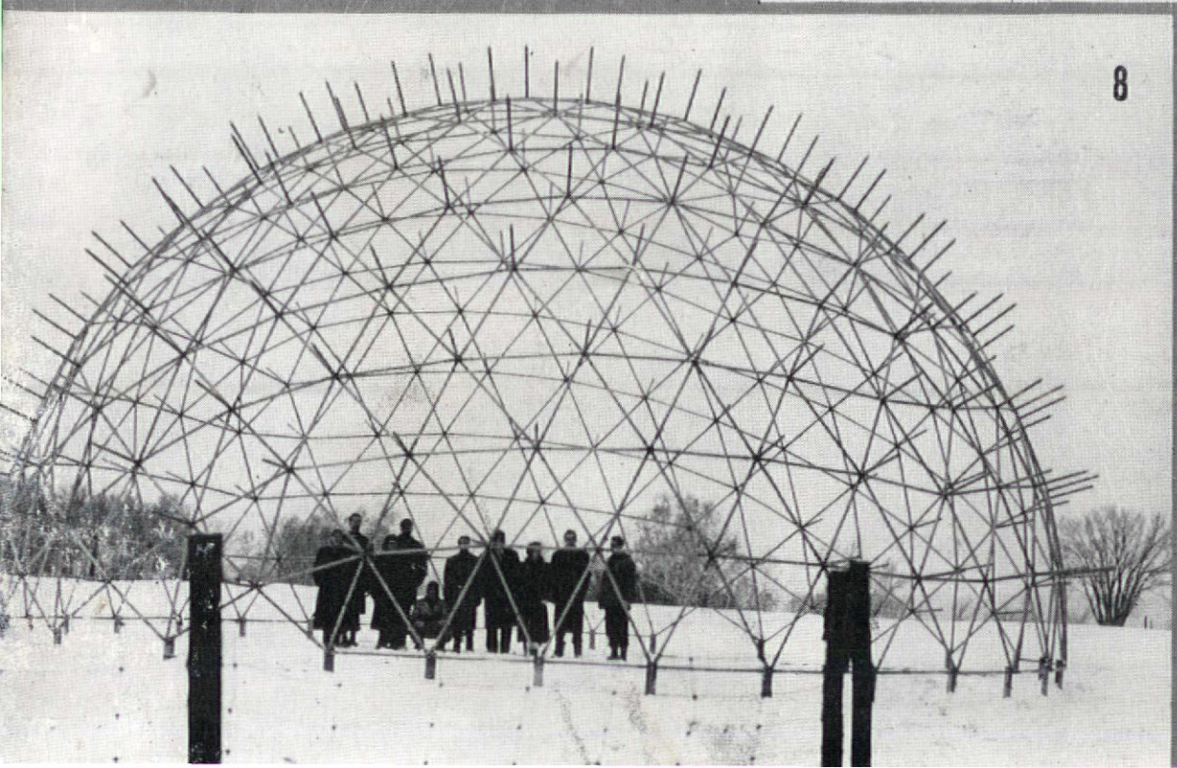




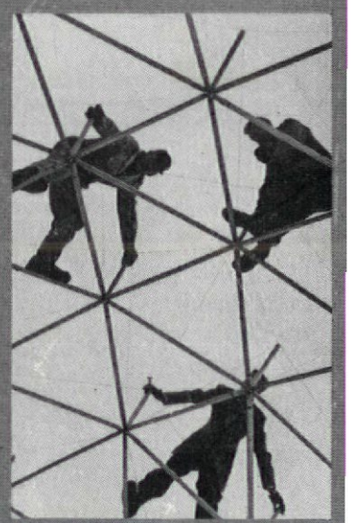
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THE DOME IS A UNIVERSAL WEATHERBREAK

Progress photos on the facing page show the erection of a 49′ geodesic dome skeleton in Montreal last winter (for other progress photos see next four pages. Putting it up without trained technicians, in cold weather, took six men less than eight hours. After it was put up ten men lifted it and carried it. A tough plastic skin completes the structure inside the framework, and the deftness of the design is shown in the way the wind is used to fit the plastic skin to the shape of this super-tent (see bottom page 149).

A number of other domes have been built, besides many models. A year ago, Fuller, who is a very energetic 56 years old, was invited to take one down to the Pentagon to show the army. He designed it small, to fit into a room (14′ diameter). The direct military, however, told him to put it up outside in the Pentagon garden, and he did, in 2½ hours, with the part-time help of two interested noncoms. The generals whose office windows surrounded the site sent out a number of inspecting teams to report more closely to them on what was going on.

There is another dome on Long Island and one at MIT where Fuller lectures part of the year. This one was put up by a student, Zane Yost, and spans 27′, enclosing 572 sq. ft. The student bought $34 worth of lumber to frame it with, and still had a third of it when he was finished. A residence in Raleigh, N. C. is under construction using the geodesic framing.

The Fuller Research Foundation calculated costs and structure on a dome for a shopping center in Massachusetts and came up with these impressive figures: they could erect a geodesic dome which would span 411′ rigidly and weigh a total of only 130,000 lb. complete with skin. This would enclose 132,929 sq. ft. and cost $330,000, of which the framework would cost only $146,000—the rest would be for a skin of a new type plastic glass fiber reinforced polyester styrene. The dome was figured to support a total snow load of 2,540,000 lb. and resist a total lift from wind of 5,000,000 lbs.

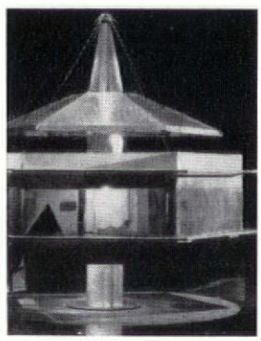
Compare this with some approximate statistics on a recently completed dome of about half that diameter constructed in Massachusetts. This is framed with steel—deep arched sections which frame into a compression ring at the center. It encloses 41,500 sq. ft., and the structural steel alone weighs about 1,240,000 lbs. This is 16 times more than a geodesic dome of the same size, also in steel.

As we reach for ever larger clear spans, with the wing span of airplanes forcing this advance in hangars, the dome is the appropriate roof form. It keeps widening its span without disproportionate increases in framing weight as the going gets wider. Myron Goldsmith, Chicago engineer, studied the spans of the world, and constructed a curve of the necessary weight in structure to span wide spaces. The longest horizontal steel truss is in a Glenn Martin factory in Texas. It spans 340′—and if it had spanned one more foot, it would have had to be almost twice as heavy to support the added length. Arches and barrels become uneconomic after 400′ spans, according to Goldsmith. The dome increase in span is followed on a straight line by its increase in weight—there is no point of diminishing return in the structural investment in domes.

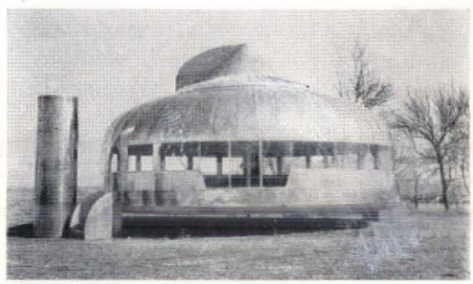
DYMAXION

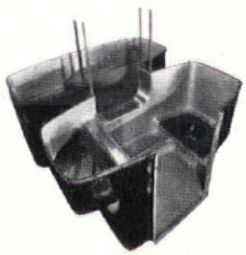
This is the word generally connected with Richard Buckminster Fuller, who was also once described as a "chunky powerful little man with a build like a milk bottle, a mind that functions like a cross between a roll-top desk and a jet-propulsion motor, and one simple aim in life: to re-make the world." Most other men are vague in their desires to improve their surroundings, but Fuller is so strong, pure and concentrated in his approach (down the avenue of mechanical structure and production) that many people believe Dymaxion, his word, has spiritual implications. It does not; it means mass-produced logic. Fuller designed the first Dymaxion house in 1927, a hexagon hung on cables. In 1933 he designed and built the Dymaxion automobile; then early in World War II he made a deployment unit, which was a successful adaption of the grain bin for emergency habitation; he patented the Dymaxion map projection in 1944; in the postwar period he also came close to fostering the first real industry-produced house.

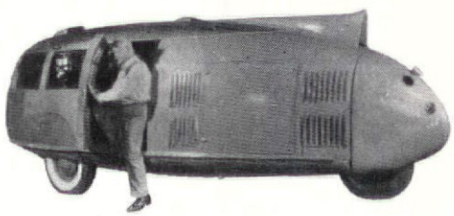
No lack of recognition or theoretical acclaim has kept other Dymaxion plans from succeeding. The final, forbidding barrier has always been the economic problem of tooling up a reluctant industry to produce the strange-looking structures—and the further economic risk of convincing the potential market that it was ready to accept them. But the struts for the newest Dymaxion development, the geodesic dome, can be made in any machine shop—of steel, of aluminum, or perhaps of glass. The expense in this one is in the thinking, and Fuller has always been a profligate spender of thought. In addition he has today a crew of smart, hardworking young associates to pounce on his geometry, calculate it, and build it.



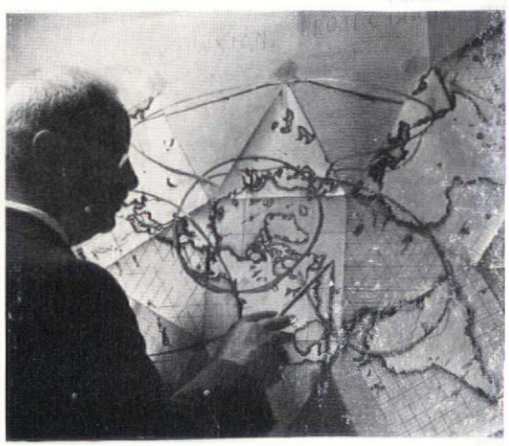








Pix Inc.



Among Fuller's projects: the Dymaxion House, the Wichita House, the deployment unit, the mass production bathroom, the Dymaxion Automobile, Dymaxion map projection.

Wide-World, PIX *Inc., Bernard Hoffman,* LIFE: *Frank Scherschel.*

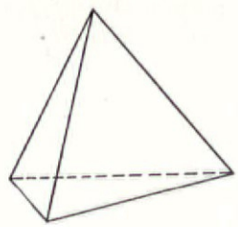
THE DOME IS ITS OWN SCAFFOLDING

Most domes are very difficult to build in concrete, the usual material for them, because they call for complicated form work. One of the startling things about Fuller's geodesic dome is that it supports itself while it is being built, and needs no scaffolding. It can be built in circular fashion, spiraling into the highest point or it can be built starting with the highest point and lifted as the periphery grows. When the domes get really big (and to the Fuller men, this means miles) some depth is needed because they become so flat that a concentrated force might dent them—although this would not break them. Solutions to provide depth are several; one is shown in the dome on page 144 which has struts like the spreaders on the mast of a sailboat to stiffen it. Another solution is building two domes one inside the other and trussing the two surfaces with vertical and angular members. Still another is a deep truss-grid which is designed in "dimpling" for integral stiffness. A new connector has been designed since the Montreal dome was put up—it is a fist ready to grab members coming in from several angles.

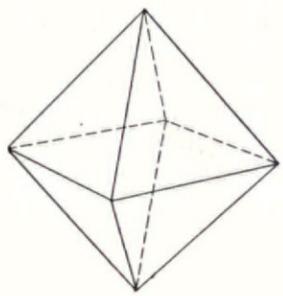
There is no necessity to build these domes as full hemispheres, unless the vertical space is valuable. To lessen the cubage of an inclosure, the dome can be made shallower—a segmented arc. As in other real domes there is no thrust at the periphery of the Geodesic dome. The load is divided and transmitted downward through so many members that bearing is a small problem. The foundations are no bigger than most roadway foundations. Anchoring the domes is actually more important than carrying them, since wind can exert a tremendous lift on such large light structures.



SPHERE — the most with the least.



TETRAHEDRON—the least with the most.



OCTAHEDRON — the start of the compromise.

Fuller postulates that the tetrahedron is the basic geometric form, because all other regular angular structures can be made up of tetrahedra, but the tetrahedron cannot be subdivided into component polyhedra of less than four facets.

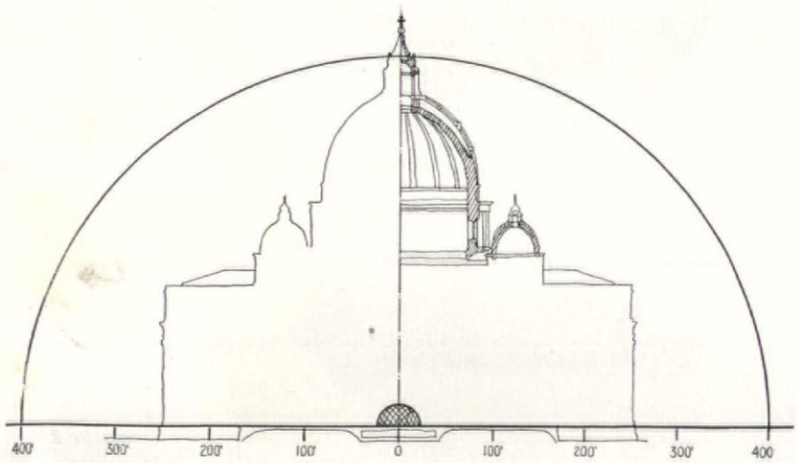
The geodesic dome is a combination of the virtues of the tetrahedron and the sphere. The sphere's virtue: it encloses the most space with the least surface, and is the best container—the strongest against internal pressures. The tetrahedron's: it encloses the least volume with the most surface, and is the stiffest form against external pressures. The tetrahedron is described as the basic truss, a triangle being a tetrahedron with zero altitude.

In order to approach the sphere, Fuller compounded tetrahedra into an octahedron, then into an icosahedron, the geometric form with the highest number of identical and symmetrical surface truss facets of all polyhedra. (20 faces. 12 vertexes, 30 edges).

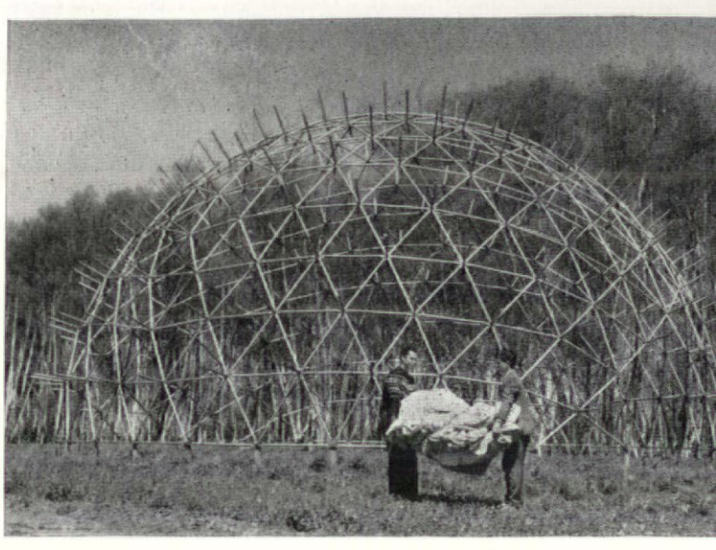
Then, in a sense, he exploded the icosahedron onto the surface of a sphere enclosing it. This divided the surface of the sphere into a number of spherical triangles, or triangles with three bowed legs. Another way to picture this is to imagine an icosahedron made of rubber, into which air is pumped until it swells into a sphere with all its former edges now lines on the sphere's surface. Each one of these lines is then actually a segment of a great circle, i.e. a great circle arc.

Fuller took the chords to these great circle arcs, removed some, added more members, and came out with a three-way grid, all of whose vertices lie on the surface of a sphere. So he has a trussed structure which quite closely approaches the shape of a sphere—close enough for half of it to be called a dome. The dome gets its name from the arcs, which are called geodesic.

The patterns of his geodesic dome vary in complexity, and the more complex they get, the stronger they are, of course. When spans to be bridged are large, it is necessary to have a



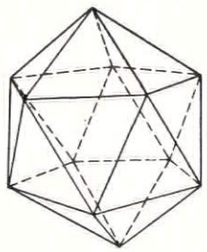
Drawing (left) shows outline of St. Peter's in Rome, compared with 800' geodesic dome. Tiny nugget in center represents 49' geodesic dome (photo, below). Just the dome spanning 137½' in St. Peter's weighs 10,000 tons. The 800' geodesic dome would weigh a total of only 1,000 tons.

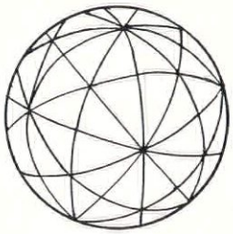


The tough plastic skin which tents the dome is shown (in pictures starting right, and continuing on following pages) being placed after skeleton is complete. The wind is used to raise the membrane, which is then fastened at numerous intersections. This skin—and skinning operation—was designed for use in the arctic. Once placed, helped by the arctic winds, it would withstand formidable gales and snow accumulations. A heavy automobile can be hung safely from an intersection of the skeleton frame.

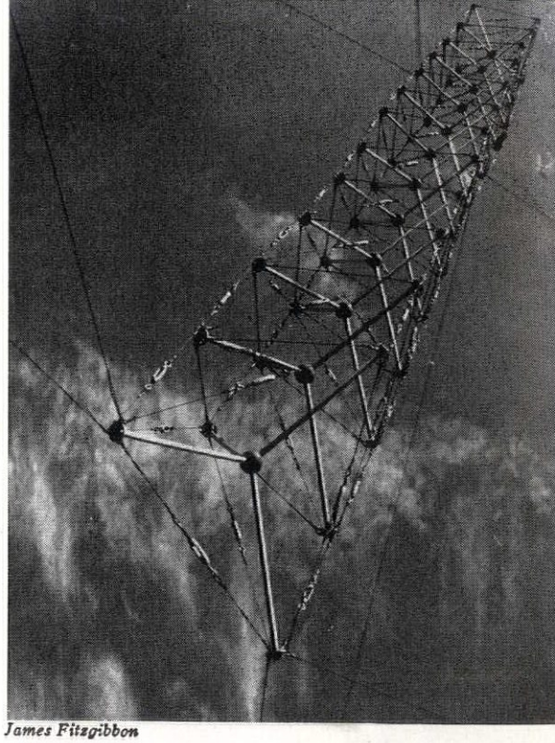
complex dome, because the struts between joints must be kept comparatively small in actual measurements . . . if not, their slenderness ration will catch up with them and they will have to be made heavy. Fuller's achievement is in the regular patterns he has created by using the great circle chords selectively and adding to them, until he has a complete skeleton system of the shape he wants, whose bone lengths are all within a 10% variation, for easy mass production.

There are actually numberless different patterns, in various complexities for various spans. Below is shown a projected pattern giving an idea of the intricate job it was actually to calculate the geometric figures of the various grids to be fitted with struts, after they had been designed. Credit for this two year job goes to Fuller's chief lieutenant, Don Richter, a brilliant young engineer.



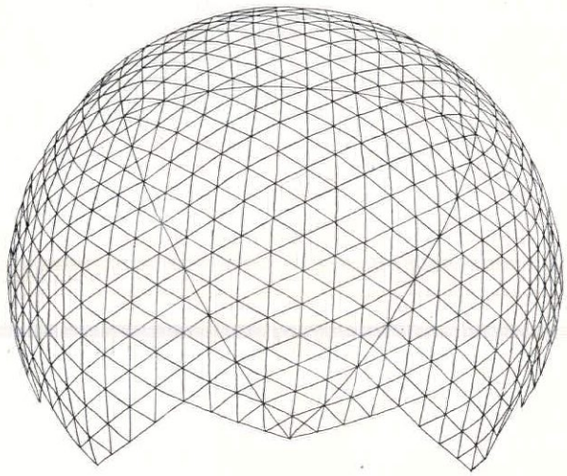


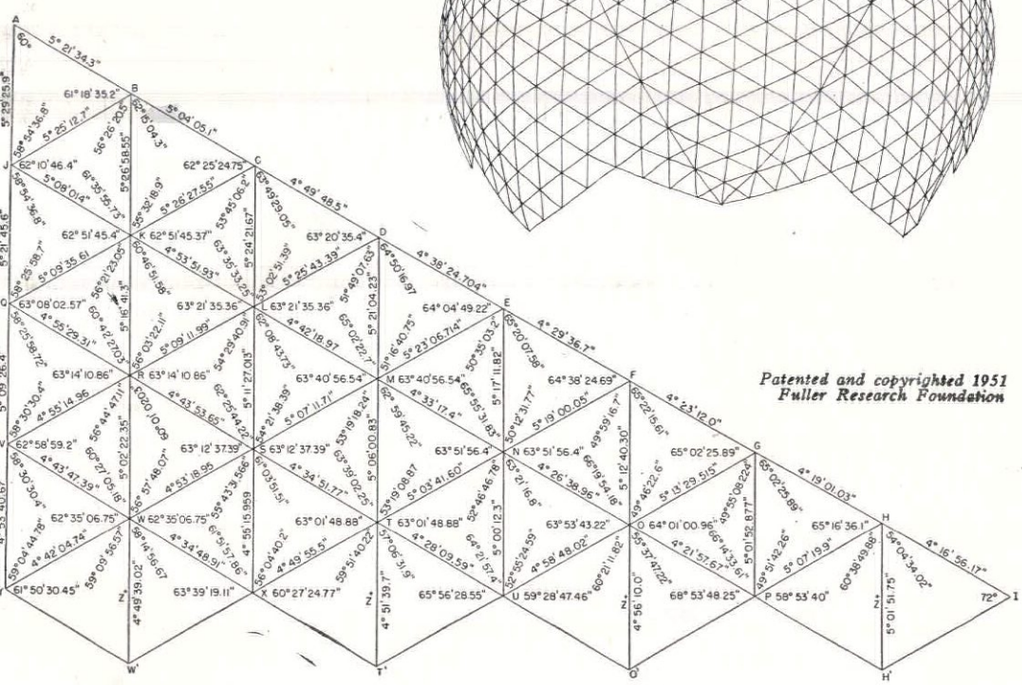
ICOSAHEDRON — (left) before explosion on a sphere, and (below) after explosion, with applied grid.



James Fitzgibbon

One of the more complex geodesic domes is sketched (right). And (below) a projected section, important in the manufacture of the dome.





Patented and copyrighted 1951 Fuller Research Foundation

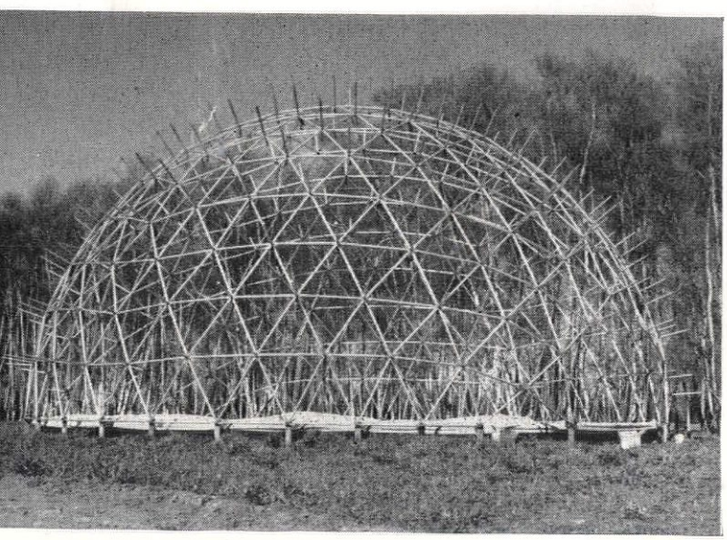
DISCONTINUOUS COMPRESSION

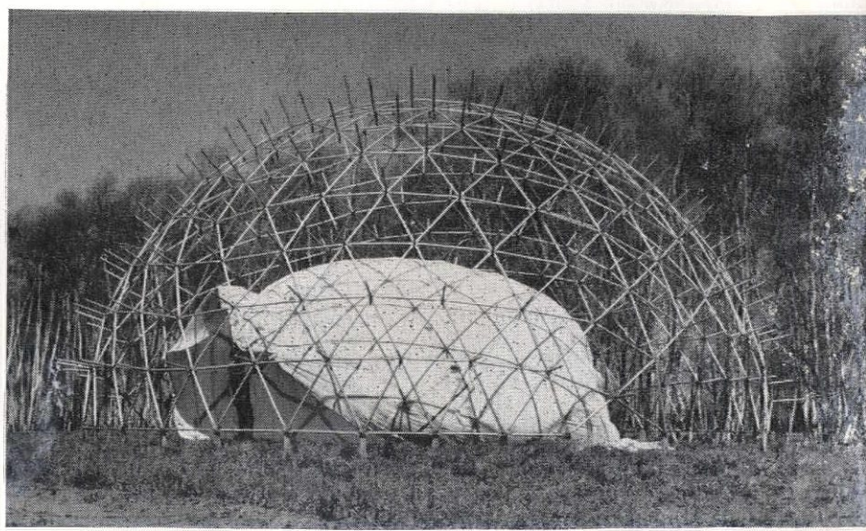
The photograph reproduced above has a miraculous appearance because the stiff compression members are totally isolated from one another—caught up in a web of tension members so the structure looks like an Indian rope trick. Historical structures have been rigid frames, assisted sometimes by pure tension members such as guys or cables. Here the main structure is the lightweight net—assisted by stiffeners.

Man-made materials have been increased in tensile power—to resist pulling apart—much more than in compressive power—to resist crushing. This fact is at the bottom of this companion investigation by Fuller in frame construction. He points out that the present compressive strength of 50,000 psi (lb. per sq. in.) in our stronger materials has been available as long as we know (in rock, for instance), but tensile strength has risen within man's memory from the limits of a woven hemp rope, 5,000 psi, to recent highs of 400,000 psi in some glass fibers.

So the more loads that can be taken in tension (like the loadings on the cables of modern suspension bridges) the stronger man is. Also, the major limit of compression members in frame structures is their tendency to fail by bending or twisting—a danger which does not limit tension members.

Compression cannot be eliminated—there has to be equilibrium. But the growing strength in tension, used like this, can give us lighter, cheaper, stronger structures.





MAKING THE DOMES AVAILABLE

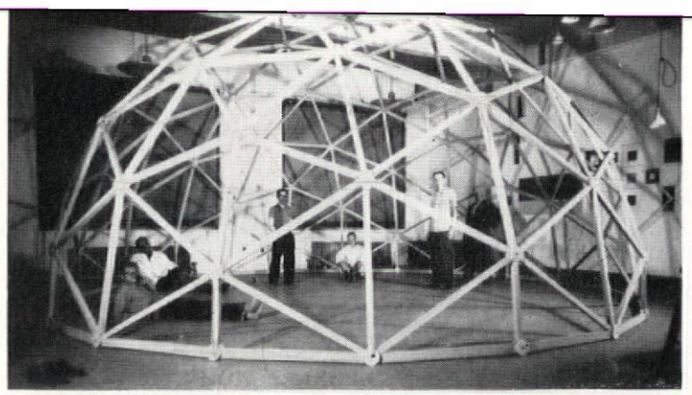
The commercial development base for the geodesic dome is at present in Montreal, because aluminum and steel are available there on the open market to Fuller's lieutenants, the initial developers and licensees, two young Canadians, Jeffrey Lindsay and Ted Pope. Both Lindsay and Pope are deep in the Fuller Research Foundation's program for continued development, but they have diverted their principal efforts to getting a parallel profit-making program set up to support the other work. U. S. licenses have not been granted yet.

Lindsay and Pope fear that misuse of the principle might smash the whole program so they plan to keep as much control as possible over the use of the structures, as well as the design and fabrication. If you want a 46′ diameter enclosure like their 8C270 *Weatherbreak*, they will deliver it and erect it in the U. S. for $7,000, duty included, but in the future they plan to lease most of the structures. Also for sale soon will be a 27′ diameter vacation house which is a geodesic dome framed and inclosed in plywood (photo, right) selling for $800 f.o.b. Montreal. Called *skybreak*,* it is 500 sq. ft. in floor area. Another specific application they are working on is an arctic weatherbreak, a particularly appropriate use because of the natural resistance of the geodesic dome's igloo shape to high winds. These weatherbreaks could also be flown into other inaccessible areas cheaply, and erected very fast.

The next market, larger domes, will be in sheltering functions like hangars and grain roofs. Lindsay and Pope plan to provide shelter by the square foot on term contracts—when the need for shelter and the contract has ended they can take their domes down and put them up elsewhere. "We figure the best way to operate is like the telephone company. If we improve our equipment we can replace it. Also, if one of the contracts is long term, the annual rent can be lowered in the amortizing of transportation and erection costs. Airplane hangar space in North America, for instance, is generally quoted as high as $100 per sq. ft. of enclosure. We can do it for ⅓ that, on a permanent basis. And there are of course further advantages in being able to take down and transport structures when their sites become obsolete."

Lindsay and Pope are still in their twenties, but they have a useful combination of experience. Lindsay, who also has capital to invest, met Bucky Fuller at the Institute of Design in Chicago in 1948, where he studied after four years as a bomber pilot in the RAF. Pope entered the Dymaxion world directly from the Montreal office of ad agency Young & Rubicam, after hearing Fuller deliver a lecture. Before that he had 3½ years of service in the Royal Canadian Navy. The two are typical of the active participants in the Fuller Research Foundation, in which everyone pays his own way, including Fuller, whose income is derived largely from lecturing and teaching.

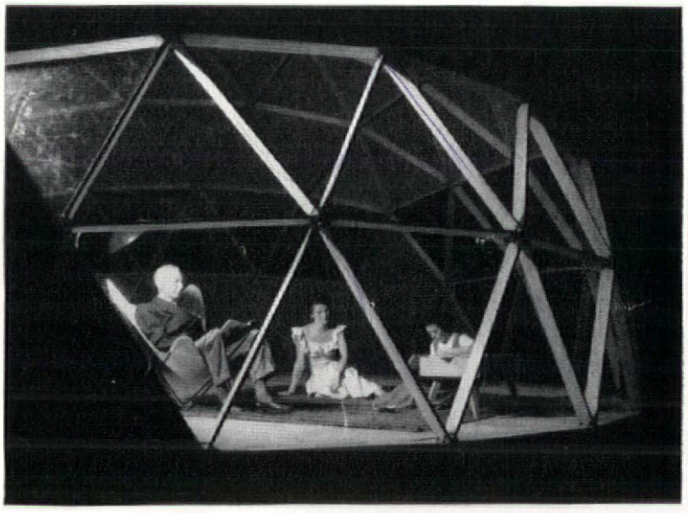
* *Copyright trademark*

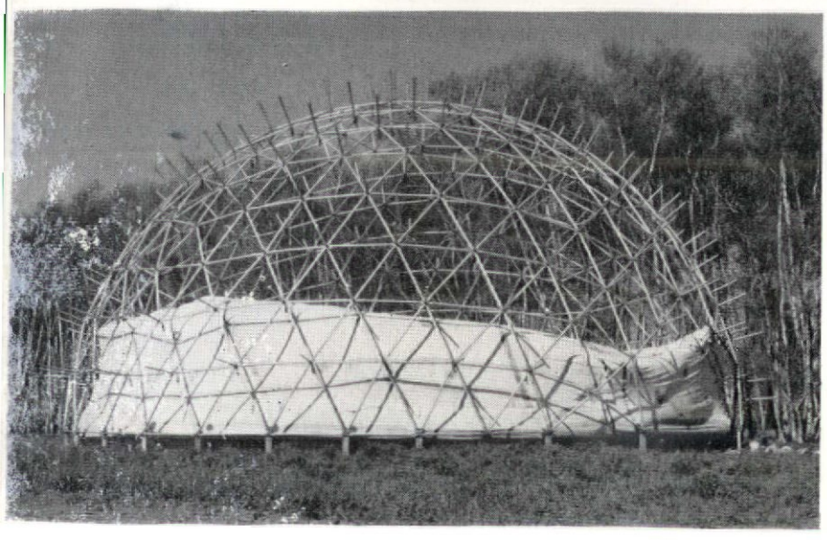


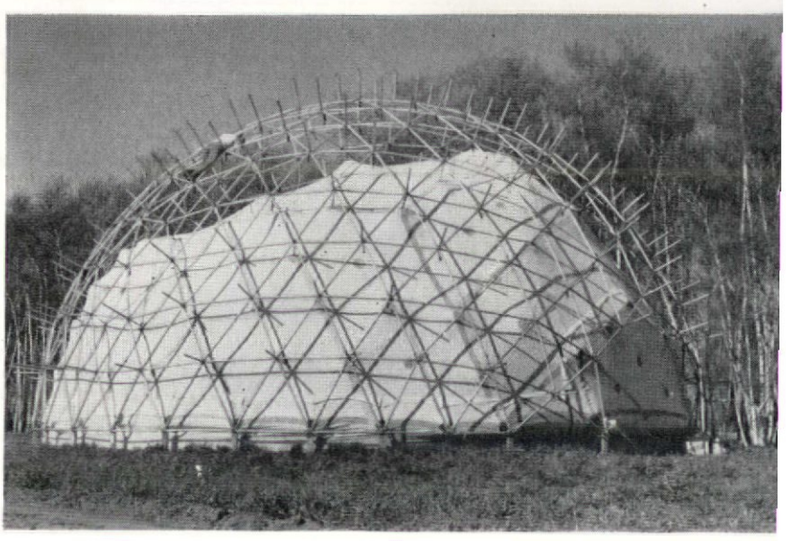
MIT student Zane Yost built simple geodesic dome frame (above) using only $22 worth of material.

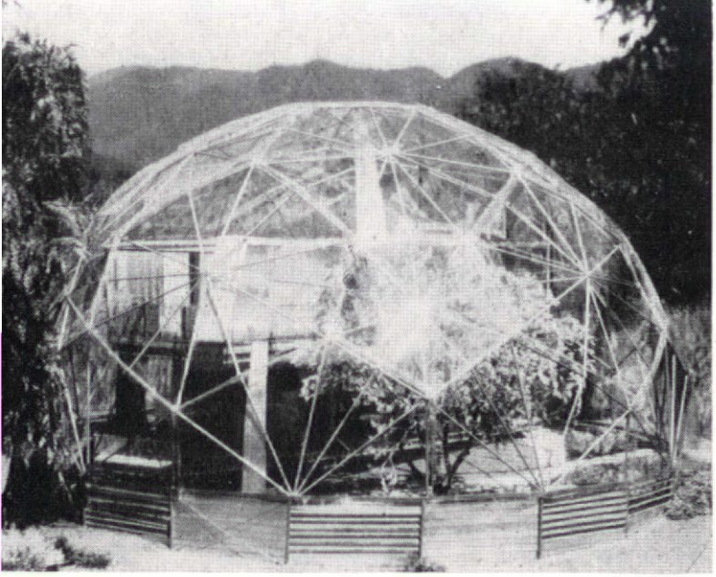


"Skybreak" dome sells knocked down in Montreal for $800. Made of plywood with plastic glazing, and foil insulated, the frame takes 60 man-hours to erect.









FULLER RESEARCH FOUNDATION: a Delaware corporation

Trustees: R. Buckminster Fuller, Chairman; Charles Eames; Mrs. David Floyd; Reginald E. Gillmor; Richard Hamilton; Knud Lonberg Holm; Jeffrey Lindsay; Edwin Allen Locke; George Nelson; William Man Parkhurst, President; Don L. Richter, Director of Prototyping; Mrs. Robert Snyder; Professor Duncan Stuart.

Fellows: Kenneth Snelson; Daisy Igel Hoffenberg; Don L. Richter; Jeffrey Lindsay; Edward Pope; Professor Duncan Stuart; Professor James Fitzgibbon; Professor Manuel Bromberg; Richard Hamilton; Zane Yost; Harold Horowitz.

THE AUTONOMOUS HOUSE

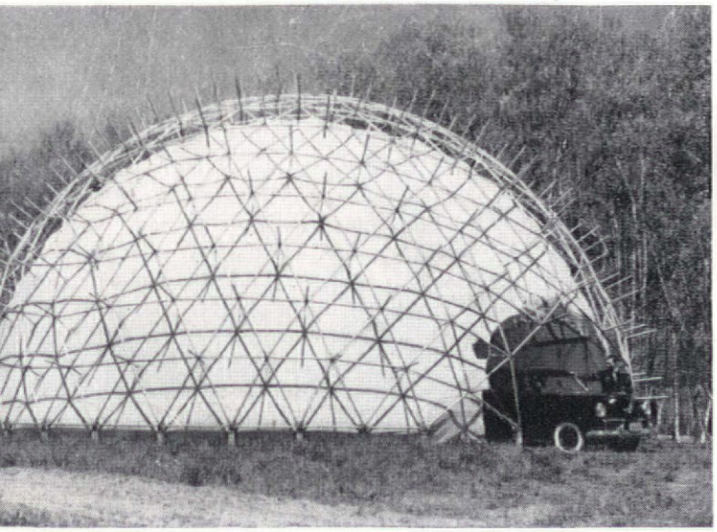
There is more in the iconoclasm of Fuller and his associates than a new structural frame, even as good a one as the geodesic dome. The dome is only a part of what they call the autonomous house. This will be a comfortable living unit which will use the geodesic dome and its plastic skin as a roof and walls—and within this shelter will be independent of public power, water and sewer lines, and not wasteful of the earth's natural resources. This independence and economy will be the result of adapting new chemicals like tetraresylsilicate in closed systems for carefully coordinating a number of uses (with its very high boiling point it can be used to carry heat energy in either direction between the boiler and the stove. heating system, refrigerator, generator, etc.).

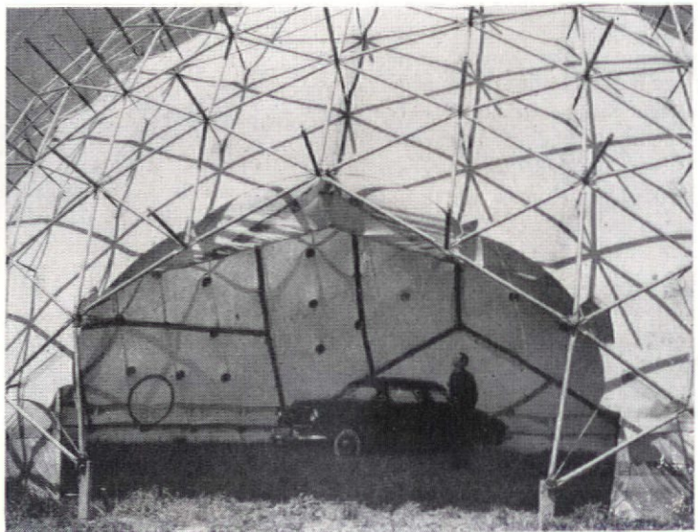
Another of the economies relates to saving water: water use in most homes is between 30 and 50 gallons per day per person although human consumption is only about a gallon at the top. The autonomous house would lower water wastage by retaining some used water, purifying it with energy produced as by-product of other equipment, and re-using it. Use of detergents and vapor sprays would also cut down considerably on lost water. All the material and equipment necessary to make an autonomous house is available, according to Harold Horowitz, who has been working on this for more than two years at MIT, in the Albert Farwell Bemis Foundation. Design is the ingredient he is adding.

And (right) as he tests the turbining strength of one of the smallest geodesic domes with his 190 lbs., Bucky Fuller is demonstrating another of the Fuller Research Foundation's tremendous assets, continuous action.



Diana Wolfes





How to save 30% on steel.—Engineers all over the country back Round Table conclusion that welding and 24,000 lb. stresses could ease the steel pinch on construction

*Top flight structural engineers have reacted quickly to the plan for meeting the steel shortage through the savings made possible by welding, 24,000 lb. stresses, and continuous frame design. This conservation proposal was first advanced by the Round Table on Waste in Industrial and Commercial Construction and later detailed by Engineer Van Rensselaer P. Saxe (*THE MAGAZINE OF BUILDING, *March and May '51). Here are a few of the most interesting letters received from engineers who wished to cheer, criticize, or broaden the proposal:*

Too conservative

Thirty per cent is very conservative assuming that the engineer is qualified to handle continuous structures. . . .

We have used welded, continuous framing in so many hundreds of thousands of square feet that we know the relative economy.

For example, we have under construction now a 97,000 sq. ft. warehouse using slightly less than 3 lbs. of steel per sq. ft. in the horizontal basic framing members although the column spacing is 40′ x 40′ and the job is figured for a 20 lb. snow load. Simple design with riveted or bolted connections would have required more than 30% more steel, costing about $32,000. Any difference in the cost of the connections would have been negligible, as the welded connections used were very simple. . . .

DAVID R. GRAHAM, *Engineer*
Tulsa, Okla.

Fabricators dislike

Mr. Saxe's arguments are sound and I have enough respect for his engineering ability to accept his designs and estimates . . . The main reason there is not a greater saving on welded work is because fabricators do not like to run both welded and riveted work through the same shop.

A. STUART COLLINS, *Consulting Eng.*
Buffalo, N. Y.

Welding at column

I agree heartily with Mr. Saxe regarding the savings to be made in steel frames.

I do not believe, however, in welding the girder to the column (at the point of maximum moment) but extend the girder out about 15 or 20% of the span and use a simple web connection at this point, depending on whether the code permits stress of 24,000 lbs. per sq. in. over the supports. The columns are then field welded to the top and bottom flanges of the girders or may have simple connection if there is no bending stress in the column at this point due to wind or earthquake forces.

This does complicate erection somewhat as the columns are only one-story in length instead of two and the frame is consequently more difficult to plumb and hold in alignment, but in buildings of moderate height this is no great difficulty, and there is much greater tolerance permissible in girder lengths, etc., and a considerable reduction in the amount of field welding required. . . .

MARK FALK, *Structural Engineer*
Falk & Booth
San Francisco, Calif.

Not justified

Based on difficult to control quality welding an overloading of design floor loads; the proposed increase is not justified.

Based upon present inadequate knowledge of the true dynamic stress due to seismic loads, the increase is not justified.

The shabby appeal to increase stresses because of an emergency caused shortage is ridiculous. The basic reason for the shortage is a desire to furnish protection from atomic attack.

A building designed for 24,000 psi does *not* give the same or better protection than one designed for 20,000 psi.

Life (public safety) and property are many more times valuable than pounds of steel and dollars of capital.

VAN LEE SCHMIDT, *Archt. & Eng.*
Los Angeles, Calif.

More than justified

I am very happy to see your article on *How to Save 30% on Steel.* . . . The amount of metal saved more than justifies the slightly higher cost of design and also the additional costs of inspection. So far we have had excellent results.

F. M. DAWSON, *Dean*
College of Engineering
State University of Iowa

Four drawbacks

Theoretically sound. . . . The saving of material would be considerable, but some adjustment in the calculations must be made because the columns will have additional bending and therefore would be heavier. . . .

Also:

1. Erection cost per ton is higher, for the same pieces of steel will have to be erected.
2. Cost of detailing per ton is higher, because the average detailer is not as familiar with welding and there are more details per ton and erection plans must indicate field welding.
3. Fabrication cost per ton is higher for the same causes.
4. Most codes require both shop and field inspection by engineers who have specialized in welding, which of course adds to the cost.

JOSEPH J. STORCH, *Engineer*
New York, N. Y.

Would cost less

You may state that a properly designed welded frame will *invariably cost less* than a riveted frame and add that its erection can be effected in 60% of the time (man-hours) that would be required by the riveted frame. Moreover, buildings of structural steel frames made continuous by welding and designed for welding, *cost less* than the corresponding similar building of *reinforced concrete.*

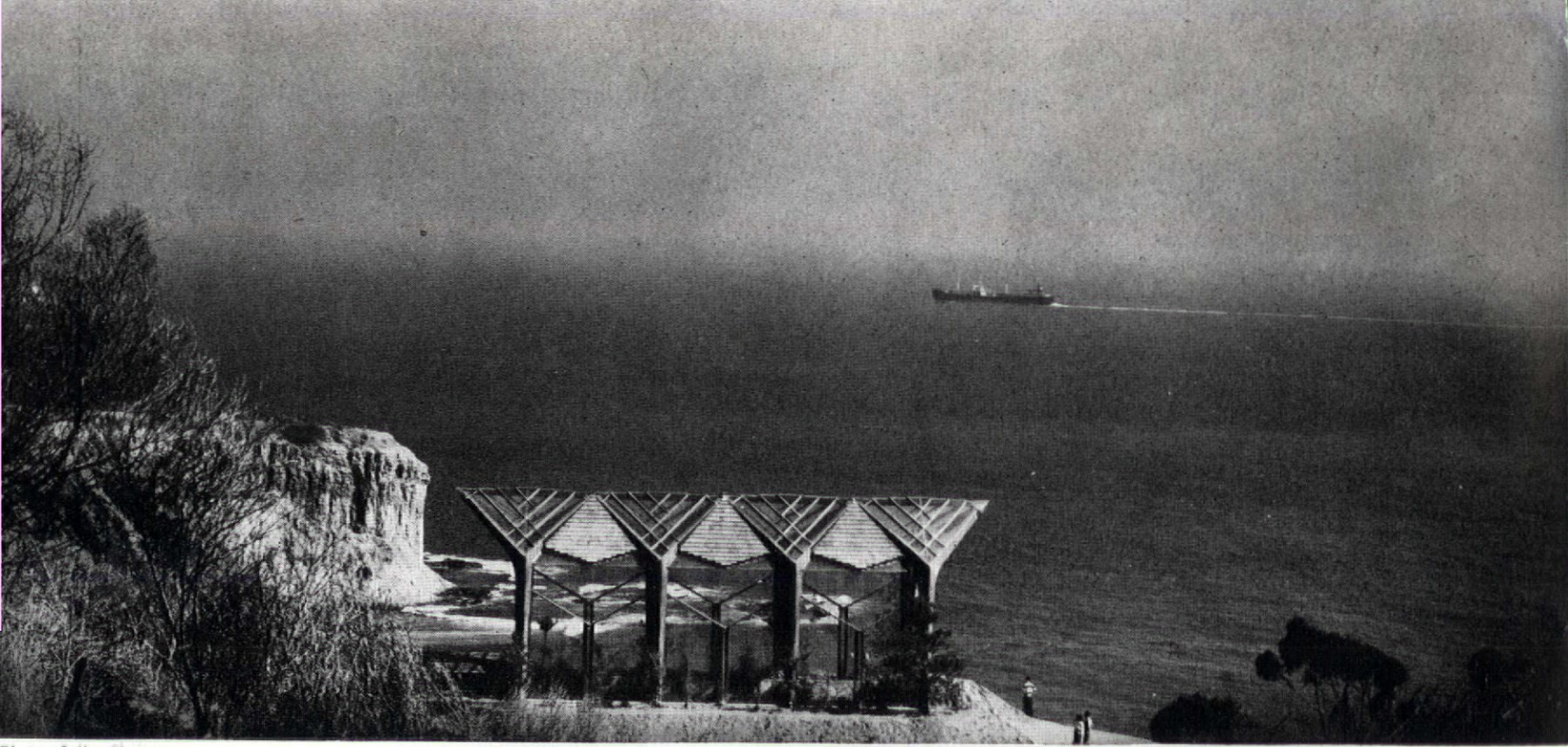
Mr. Saxe's claim of a 30% saving is rather a broad statement; the saving is actually a function of the physical requirements of the building itself. Buildings with long and multi-spans, heavy live loads and multiple stories, will prove greater in savings than buildings with short spans and few in number, light live load and few stories in height.

The all-welded steel building frame has been my study subject for many years, and the conclusions of Mr. Saxe confirm my findings in both study and actual results from structures designed by myself and erected under my supervision. The saving in steel tonnage is not all of the saving performed; the story height, the amount of fireproofing, and the reduction in column and foundation load accrue added savings.

I would recommend 24,000 lbs. maximum unit stress for those buildings whose floor live load design is seldom, if ever, fully applied. Office, apartment, hotel, hospital, school, auditorium, church buildings fall under this category. There are occupancies, however, in which I have observed a live load greatly in excess of the design load. Warehouses, manufacturing buildings, mill buildings, etc., should be designed more conservatively because of possible increase of loading due to abuse, change of machinery or other reasons unforeseeable by the design engineer.

I consider it safe to design using 24,000 unit

(Continued on page 88)

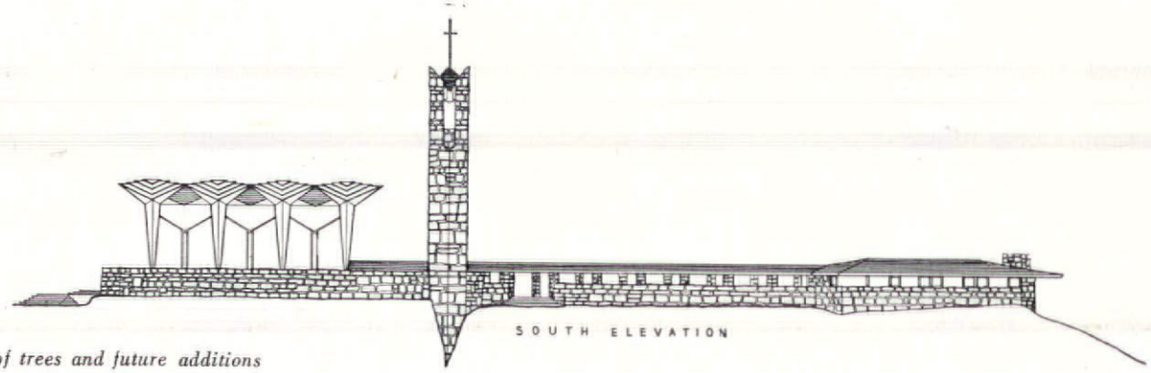


Photos: *Julius Shulman*

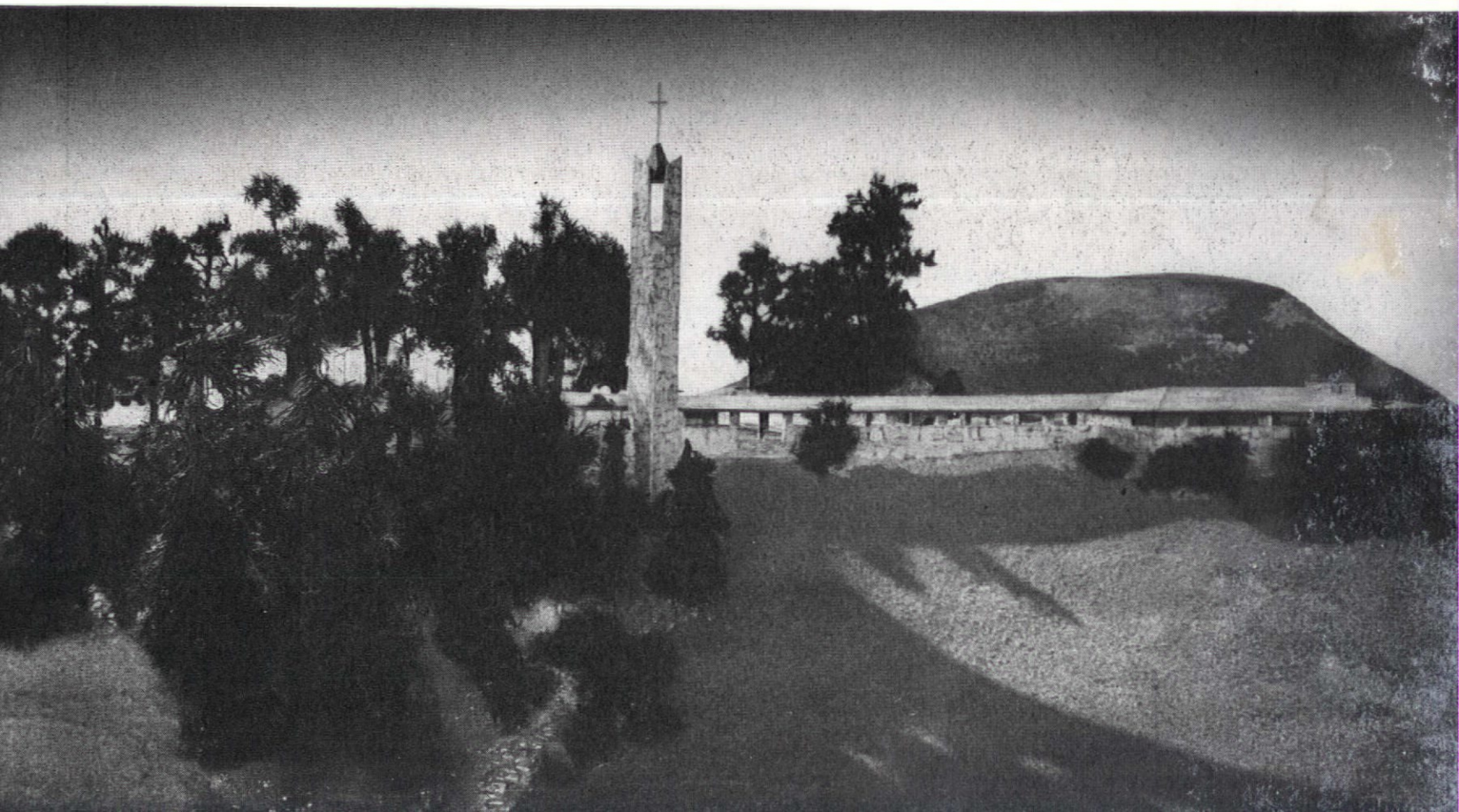
The chapel's basic structure . . .

WAYFARER'S CHAPEL opens services to sea, hills, and sky

OCATION: Palos Verdes, Calif.
LOYD WRIGHT, Architect



. will be completed by growth of trees and future additions





With the idea of recapturing the spirit of the first sermons by the sea, Architect Lloyd Wright has put together a new kind of church —a sparkling enclosure of glass framed in the modern equivalent of Gothic tracery and carrying the glass further than the Gothic builders ever carried it—up into the roof.

In this Wayfarer's Chapel on a bluff overlooking the Pacific at Palos Verdes, the sea, the hills and the sky were meant to become a part of the service, much as they were in Galilee.

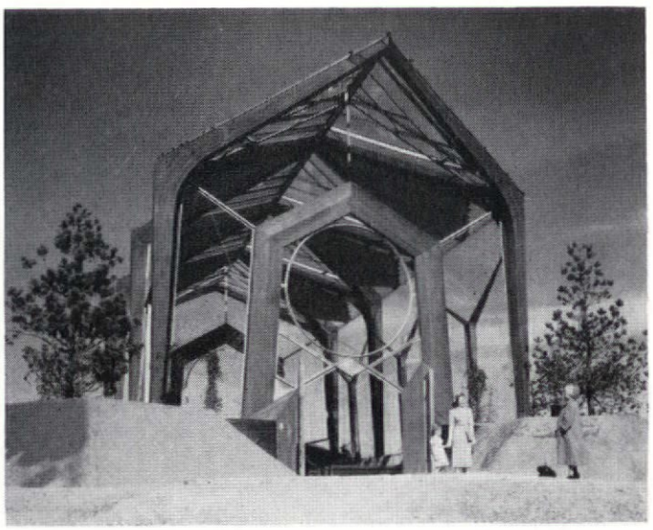
As it now stands the chapel is only a partial expression of Wright's design concept. With "the Sequoia cathedrals of Santa Cruz" in mind, he envisioned a core of sheltered space whose only visible walls would be formed by a surrounding grove of California coastal redwoods. Planted in broad earth berms on each side of the chapel, these trees when full grown will arch above the roof. They will temper the sun's heat, form vistas through their branches to the magnificent panorama around them, and echo the building's tracery.

The rigid frames of redwood, instead of forming the usual arches, branch out at the haunch into a diagonal Y-shaped pattern. They cut the roof into a series of triangles alternately of glass and of sky-blue tile. The Y-theme of the main frames is repeated with variations in the lighter tracery of the walls. Wright used standard-size plate glass throughout, designed the superstructure to resist 50 lbs. per ft. wind load.

Within the chapel, shoulder-high walls of native stone topped with planting anchor its airy framework to the earth. At night, floodlights recessed among the plants will illuminate the interior and pick up the shapes of the trees above the glass. The solid sections of the roof, faced on their inner surface with blue acoustic plaster, help to control sun and sound. Since services are mainly vespers, the congregation faces east, away from the late afternoon sun and toward the inland hills.

The chapel and the grove are the first stage of a project which will eventually include a 60′ high carillion tower, a community house and a cloister overlooking a garden of Biblical trees and shrubs (plan, right). All elements are laid out vertically and horizontally on 30° or 60° angles, so that the triangle—symbol of the Trinity—is repeated with variations throughout the project.

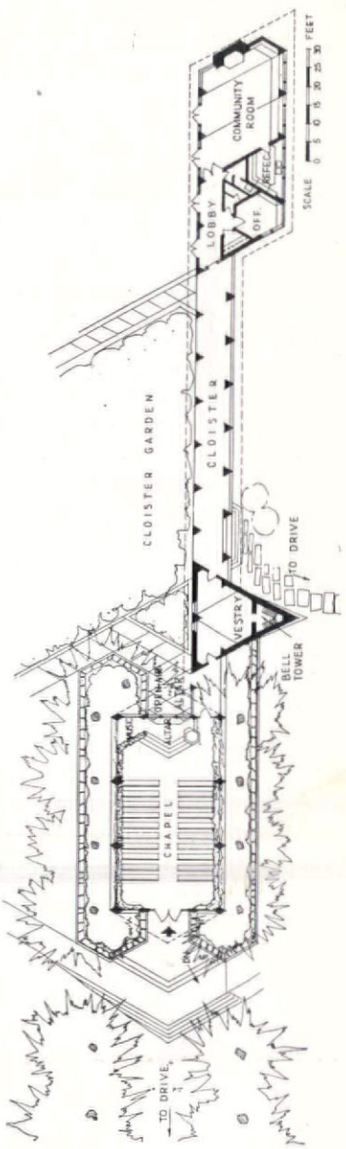
Designed as a place of worship for the followers of 18th Century theologian Emanuel Swedenborg, the chapel also serves the entire Palos Verdes community and has attracted thousands of wayfarers since it was first opened to the public last May.



Entrance opens toward the sea, will be shaded from western sun as outer walls of evergreen grow higher.



Skyward view suggests how interlacing pattern of glass, redwood, steel and blue tile will tie in with the forms of the surrounding grove.

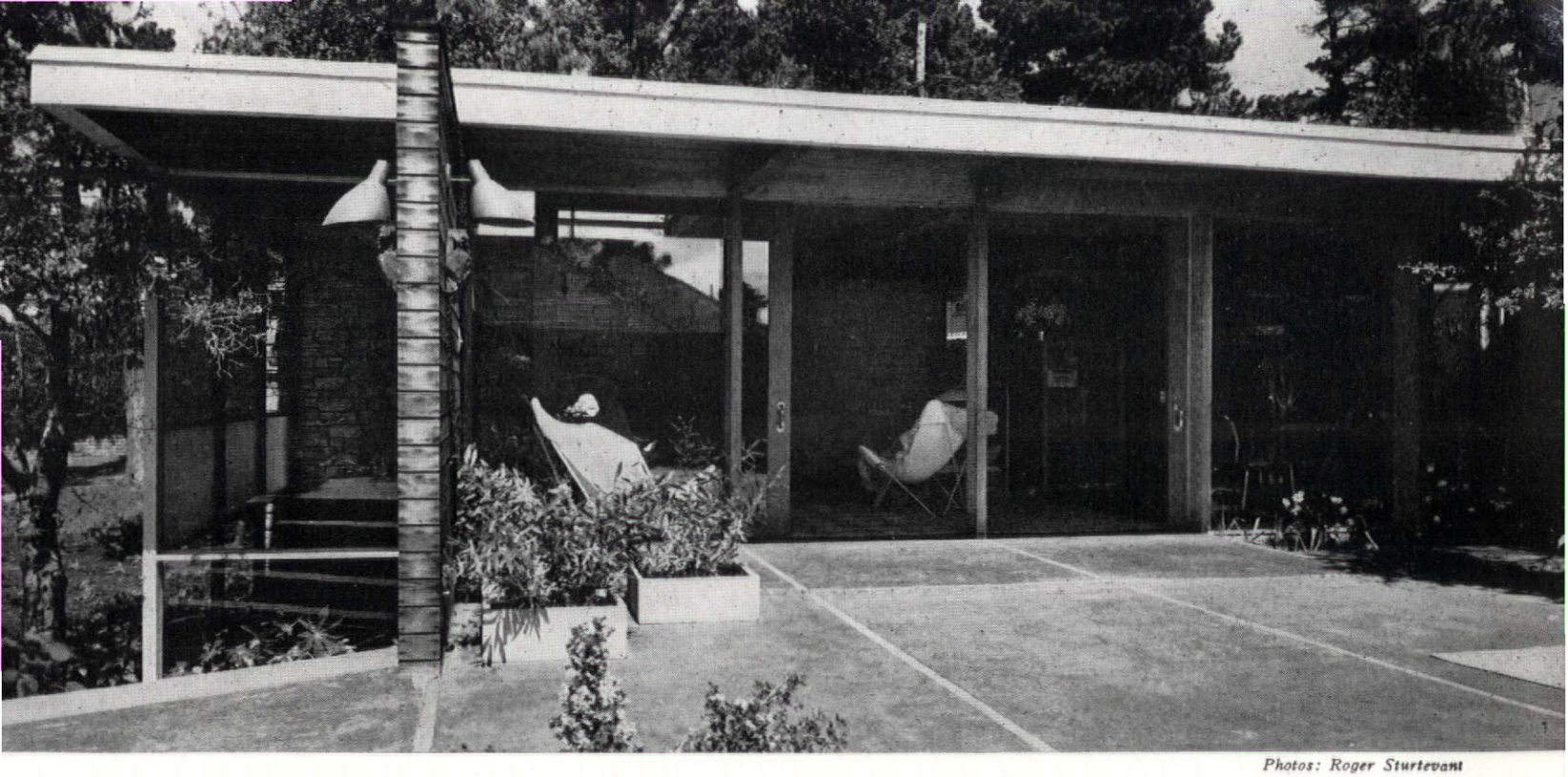


Photos: (top and below) Herbert A. Lowman; (center and left) Julius Shulman





VACATION HOUSES



Photos: Roger Sturtevant

house you spend your vacation in can be about as informal s you want to make it. After all, the reason most people o off to the country is to enjoy the COUNTRY—not to enjoy ll the comforts of city-living. The less formal the archi-ecture they have around them the better they will like it. In Henry Hill's house on these pages it would be hard to ell where nature stops and "architecture" begins; in Wil-am Hempel's cottage (p. 159) the trees, the Santa Cruz ountains and the sky are all part of the unpretentious de-gn; and Henry Hebbeln's North Carolina house (p. 160) is mply a frame for a view of the Blue Ridge.

Every architect knows that these handsome houses didn't et that way just because their designers omitted the architecture." The process is not one of subtraction; it is matter of exceedingly subtle integration. Some will say iat the work of man and the work of nature should be early separated; but where man wants to get away from l symbols of his work, architecture should become sub-dinate—a means of enhancing nature, a quiet place to sk in the sun.

1. CARMEL, CALIF.

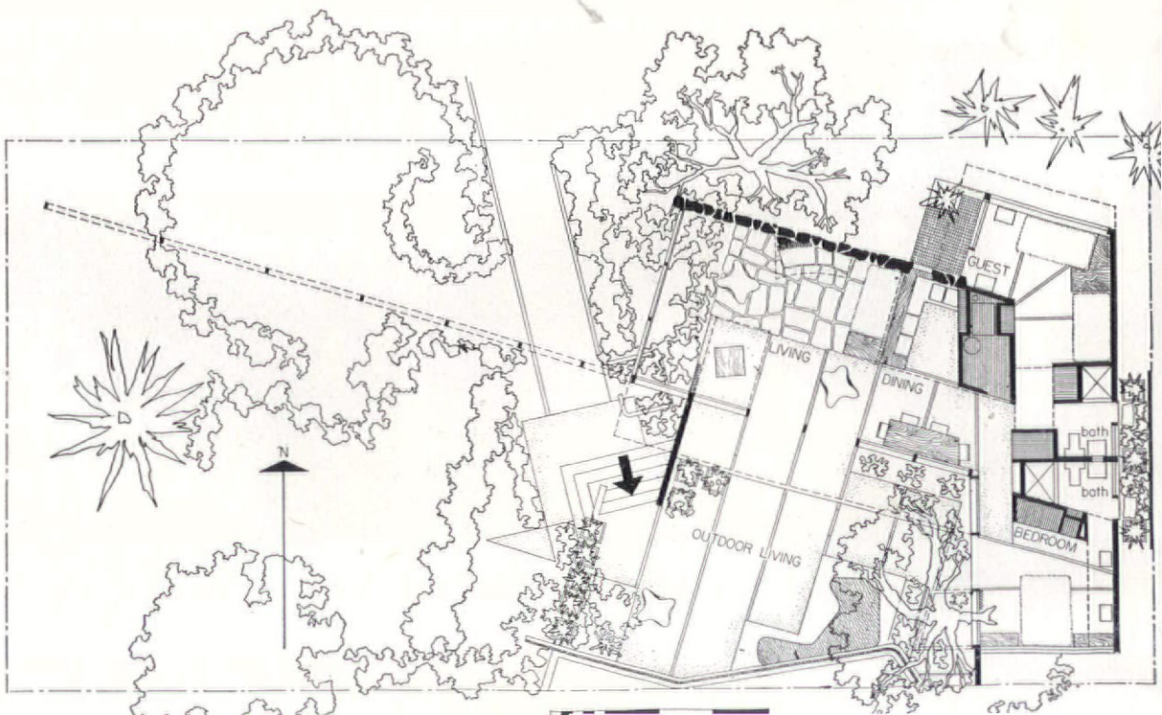
HENRY HILL, Designer

ECKBO, ROYSTON & WILLIAMS, Landscape Architects

GEORGE WOOLSEY, General Contractor

In Henry Hill's own vacation house most of the views are within the boundaries of his 50′ x 100′ lot. With the help of the landscape architects, Hill turned the entire lot into a lush bower, then set up a few screens, walls, sheets of glass and fences so as to create an indoor-outdoor living area and two bedrooms. Where a sheet of glass cuts across the branches of a tree, the tree is simply allowed to continue through a hole in the glass. Flower beds, paved terraces, leaves and branches exist both inside and out. The architecture virtually disappears in a playful natural setting.

Hill drives 2½ hours from San Francisco to get to the charming town of Carmel. He had always dreamed of building a house there; nowhere else in the U. S. had he found so unspoiled a community. The lot which he bought after the

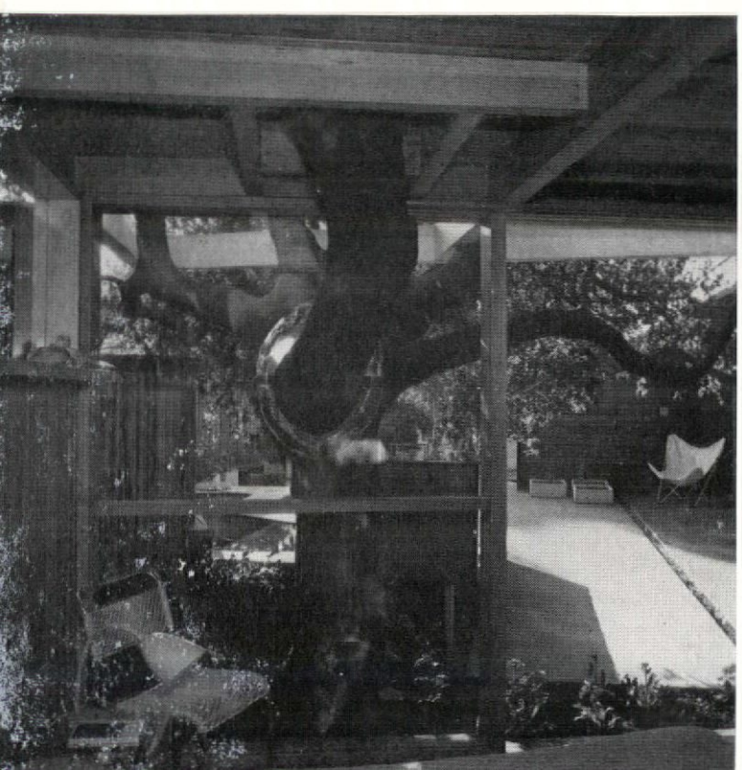


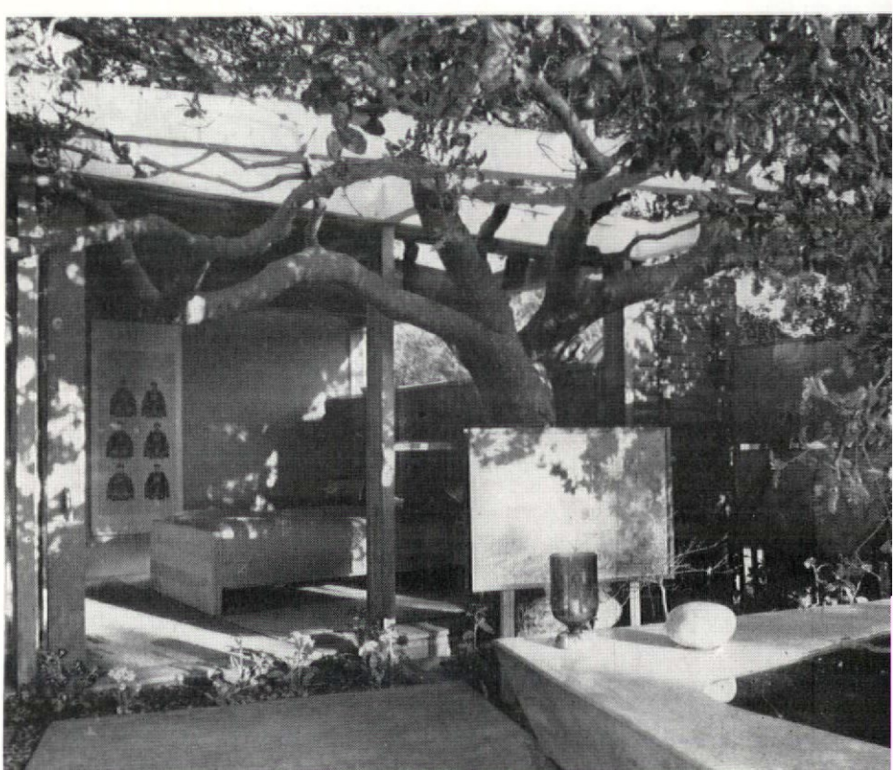


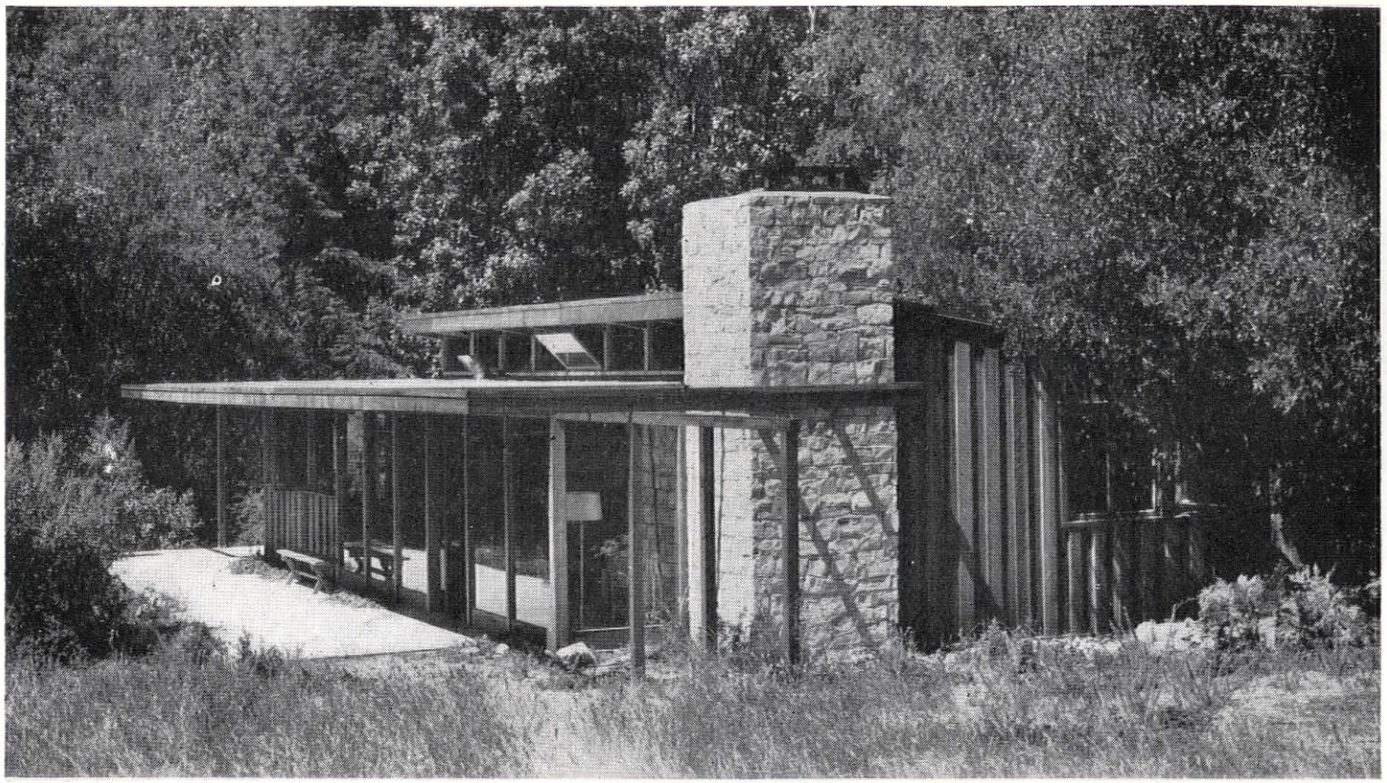


war has a distant view of the bay. The vacation place he decided to build on this lot was to serve his family and his friends; a small guest apartment with its own outside entrance can be used quite separately from the rest.

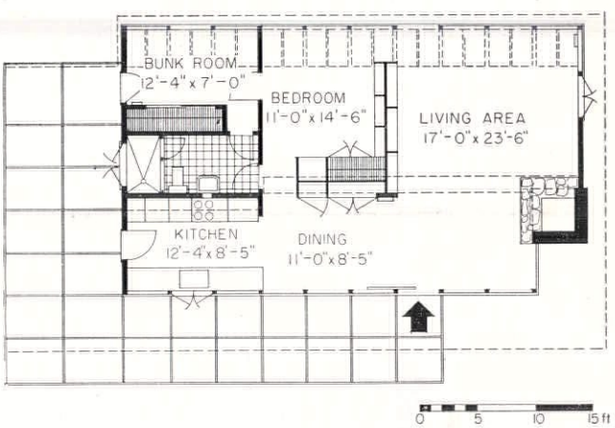
The spectacular colors of flowers and other plants are played against the backdrop of a cocoa-brown concrete floor slab, of natural Carmel stone and of waxed pine walls. Inside the house there are some charming decorative touches: A wall in the passageway finished in Chinese red lacquer, a bookcase covered with Piranesi prints, a screen covered with Michelangelo sketches, a plank ceiling whose beams are stained with gilt. These touches (together with the free-shaped pool, the angled steps and terraces and the curving screens) add up to a warm, rich, almost baroque expression that is gaining more adherents every day. Few of them, however, know how to handle the idiom as well as it was handled here. For less than $10,000 (incl. all landscaping) Hill built himself a pleasure pavilion out of a Chinese fairytale.







Roger Sturtevant

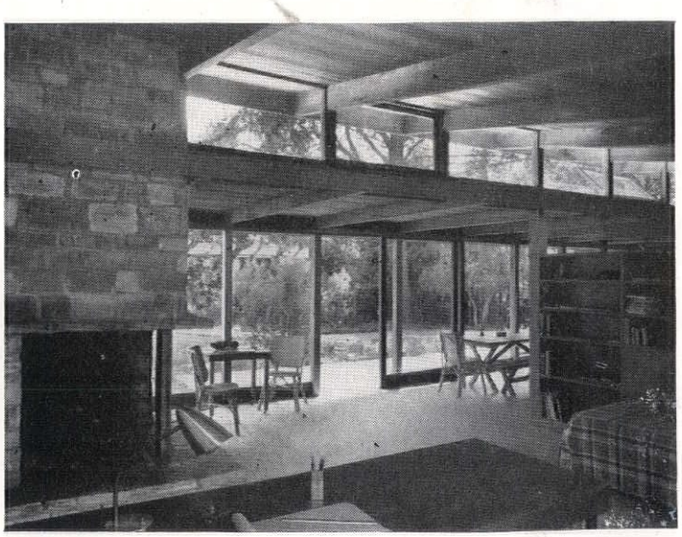


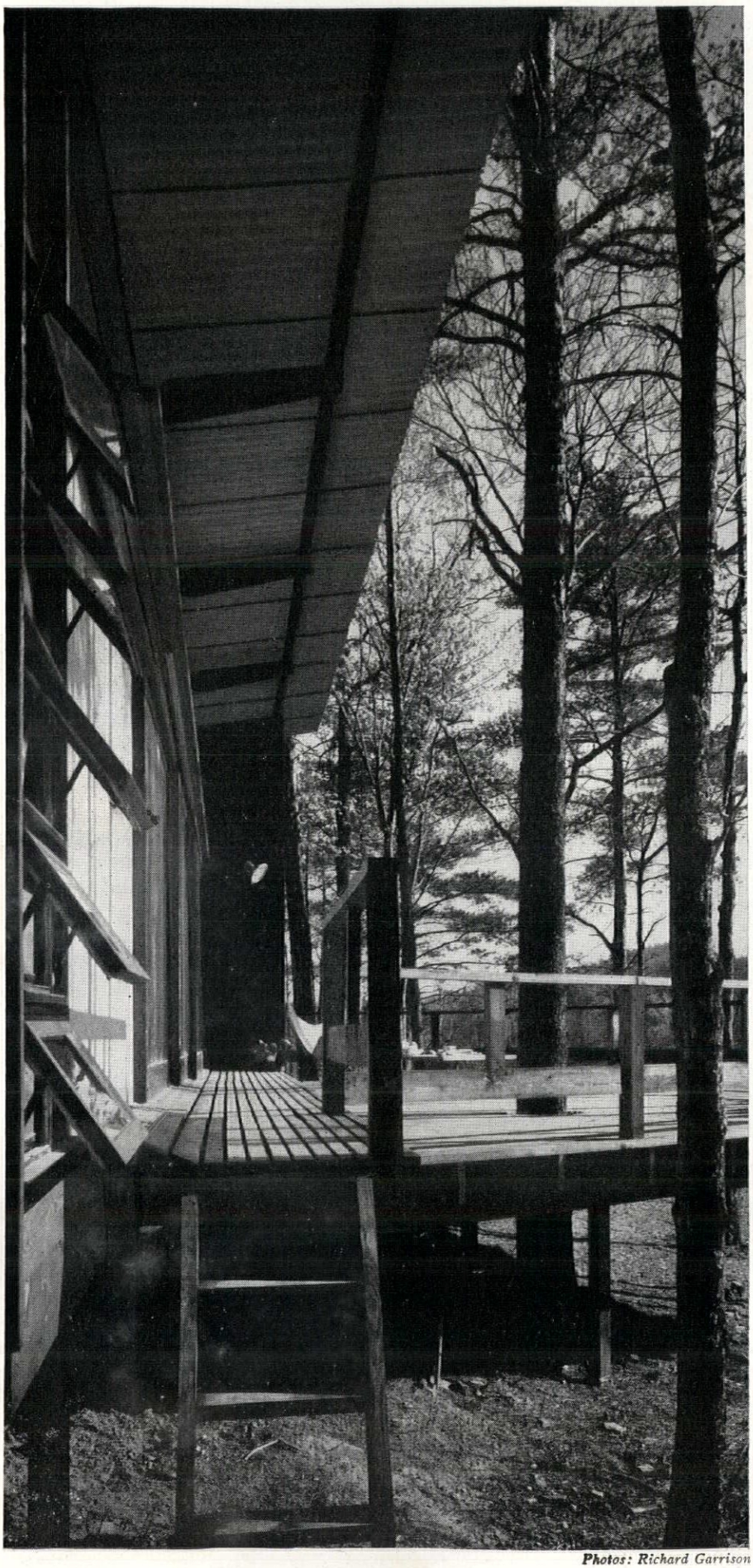
2. SANTA CRUZ, CALIF.

WILLIAM F. HEMPEL, Architect & Builder

The botanist for whom this neat house was built uses it as a year-round base from which to take field trips and in which to relax, write and study. To give him a stimulating setting, architect William Hempel built a redwood frame and filled most of it with glass—in the walls, in a long clerestory down the spine of the plan, and in a skylight over the entire northern edge of the rectangular cabin. The rest of the structure is untreated redwood siding. The floor is a waxed concrete slab. The area is 980 sq. ft., at a little over $9 per sq. ft.

The result is airy, sunny and light—almost a greenhouse with the plants left standing outside. To get real spaciousness within the small structure, Hempel kept storage walls clear of the ceiling, left out most doors and unnecessary partitions, brought light into the center of the plan through his clerestory, and extended the roof in all directions with deep, trellised overhangs. The sun gets into the house sufficiently to help warm it for year-round use. The fireplace, together with five electric panel heaters, does the rest.





Photos: Richard Garrison

3. TRYON, N. C.

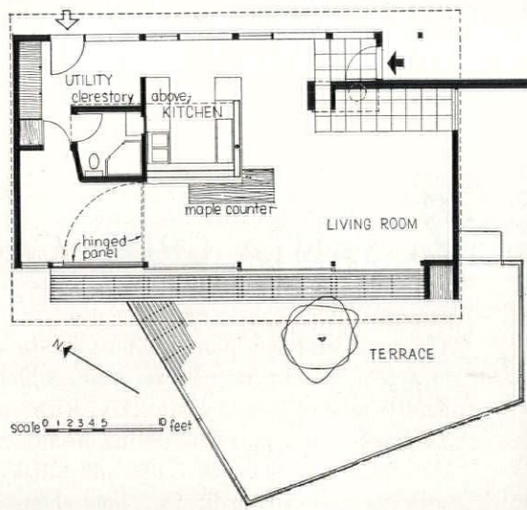
HENRY HEBBELN, Architect

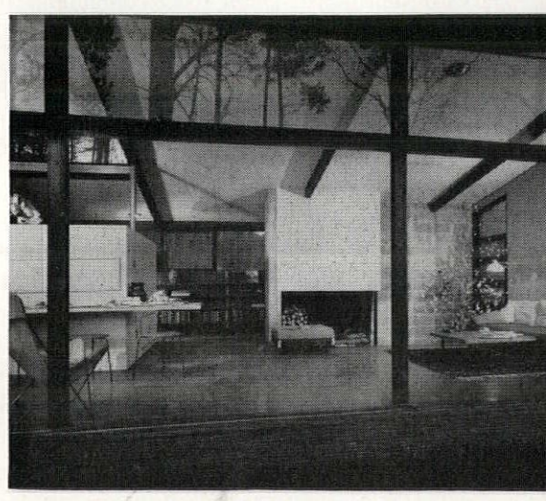
PAUL RENEAU, General Contractor

This 800 sq. ft. cottage among the pines faces a gap in the Blue Ridge mountains to the west. From this gap come the prevailing breezes; in this gap the sun sets every evening.

The tall pines, the view and the breeze give architect Hebbeln's house its character. The structure is simple: 4 x 4 posts carrying 4 x 8 beams which support a corrugated asbestos roof on purlins. To the underside of the purlins Hebbeln attached electric heating panels 1/8" thick, 4' square, that make this a year-round vacation house. The walls are glass or vertical pine boards—and—battens creosoted almost black; the window frames and sash are painted black to match; but there is a chalk blue color accent in the wall panel in the south-west facade.

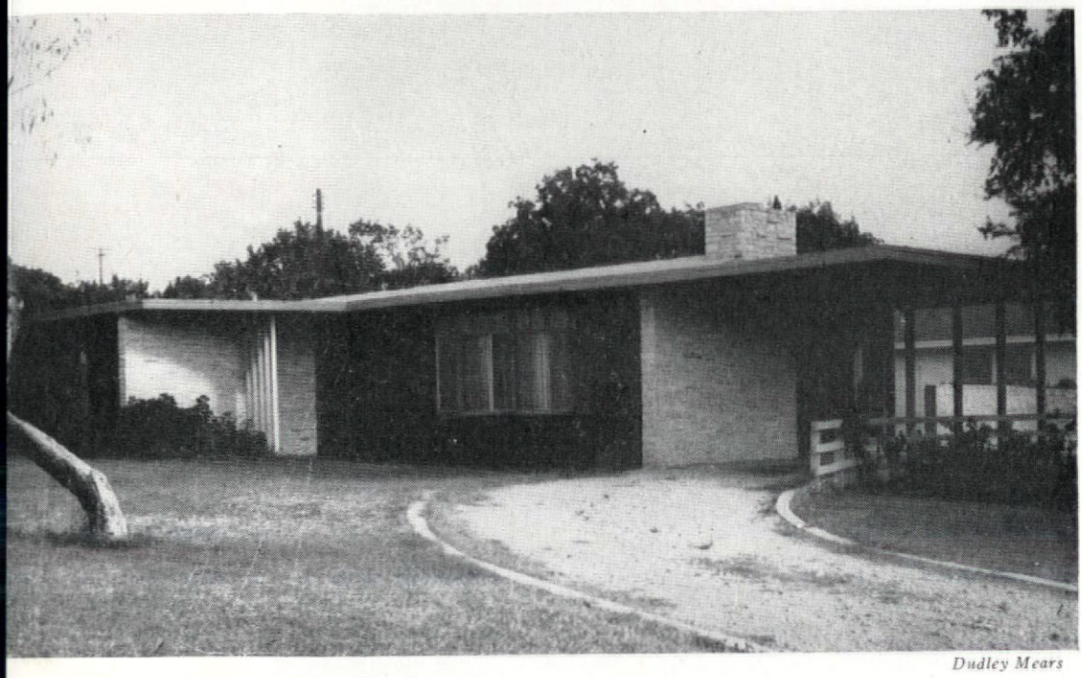
To keep out bugs, Hebbeln designed an accordion hinged screen wall that can be folded back into a pocket at the east end of the glass wall. The total cost of the house was $10,000 with all furniture.







NED COLE'S IDEA FACTORY: so well does this young Texas architect produce ideas for builders' houses that his designs were used in some 1,500 units last year



Dudley Mears

Builders looking for new ideas can find a number in the work of architect Ned Cole of Austin, Texas. Cole designs a contemporary house that has proven salable in several Texas cities. His low, uncluttered exteriors and wide overhangs have taken the curse off the box-like look of many small houses. His floor plans make small houses seem larger. His prefabricated storage walls give 33% more space than FHA minimums at the cost of closets they replace and bring some of the qualities of big-house living to the small-house family.

Houses above (in Austin) and just below (in Corpus Christi) cost $11,000. Wide overhangs, horizontal lines of windows and carport are designed to give houses long low look which seems to make them larger than they are.

Architect Ned Cole of Austin, Texas is so full of ideas and energy it takes three jobs to hold him down. Each job is woven into and supplements the others and the three together make him a valuable man for builders to know.

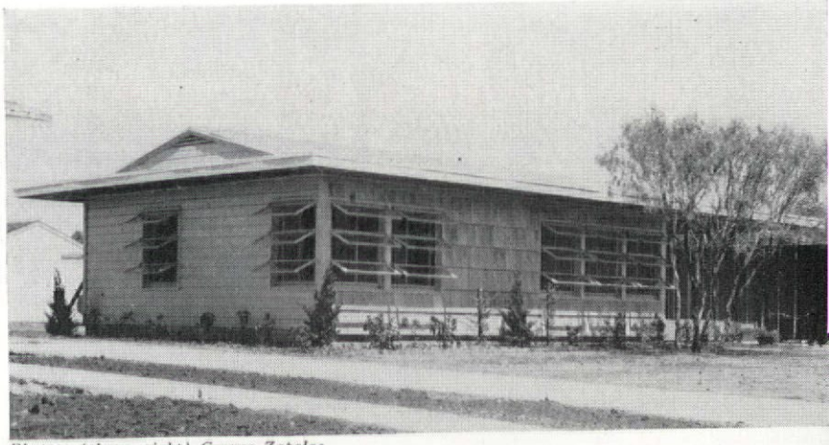
As an architect he runs a full-fledged design service that supplies plans to some 30 builders who put up 1,500 Cole-designed houses last year. This places him among the top half-dozen designers who work with merchant builders.

As a house builder Cole does enough to keep himself up to date on costs and new methods—and lets him try out his own experimental ideas.

He is also controlling stockholder and manager of a factory that prefabricates storage cabinets. This business did a gross of $750,000 last year and would probably have taken in $2 million this year if the housing market had held up. His spare time, as the saying goes, is devoted to his wife, three small children and a house he has just finished for himself. That Ned Cole does all these jobs exceedingly well marks him as a man of talent and a real comer in the building industry.

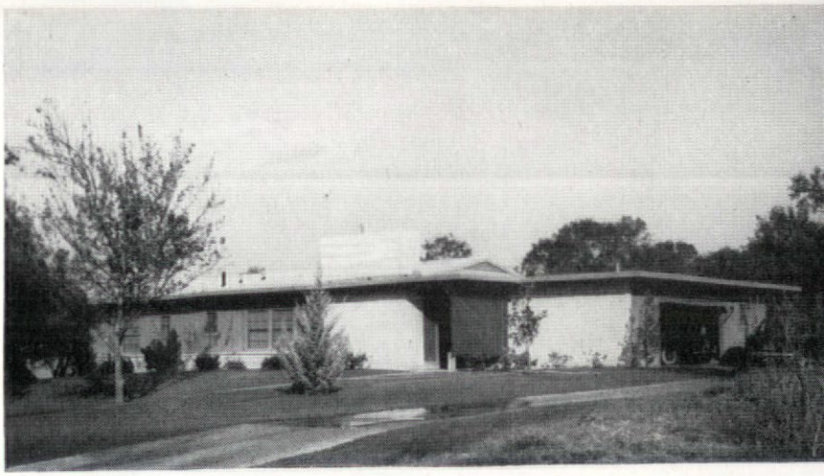
This slender, soft-spoken, 33 year old architect is making news in the housing field partly because he is reversing a Texas trend. In the mushrooming, oil-rich towns of Texas most able architects are lured away from the housing field by lush commercial contracts. Big building's gain is the small house's loss, and this occupational trend accounts for the poor design of so many builders' houses.

But fortunately Ned Cole likes houses. He doesn't want to move on to higher things. In his brief postwar career he has already shown that an architect can make a good living from small-house design and related activities and that such work can be as exciting and satisfying as most architects want. He has specialized in such attractive houses that he is steadily adding builders to his list of clients.



Photos: (above, right) George Zapalac

The house below was built in San Antonio and cost $20,000. It has the low, ground-hugging lines that are popular now in the Southwest.



What can an architect trained in construction offer to builders?

Architect Cole has had many conversations with builders that are along these lines:

Builder: How can I sell houses when a town gets overbuilt and competition gets tough?

Cole: Build a house that attracts attention by its dramatic design, color, lot placement and by its livableness. Keep it different from its neighbors, but not too different. Give it some sex appeal.

Builder: How can I make a small house look larger?

Cole: Keep it low. Use horizontal lines in the windows. Use an overhang.

Builder: How make the inside look larger?

Cole: Use an open floor plan, larger windows. Use outside areas for view and for living space. You can actually make rooms larger by substituting prefabricated storage walls for old-fashioned walls with closets.

Builder: But storage walls are for higher priced houses . . .

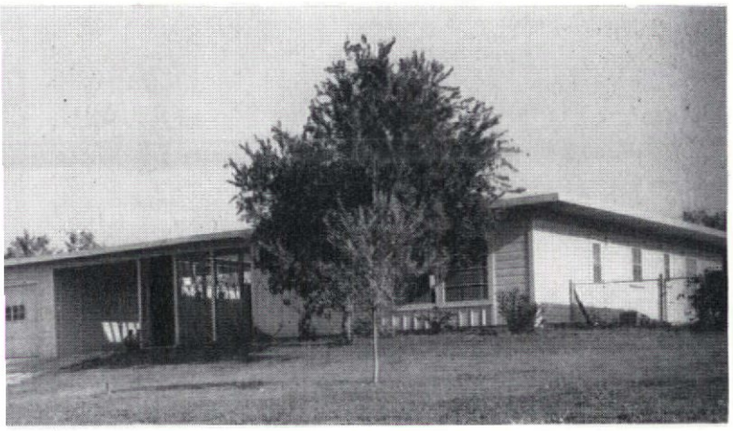
Cole: They've been used in hundreds of houses selling for less than $10,000. In fact, we put $1,200 worth in a $6,400 house. They look like luxury equipment, but cost no more than the typical partitions that contain closets.

Builder: What's the public reaction?

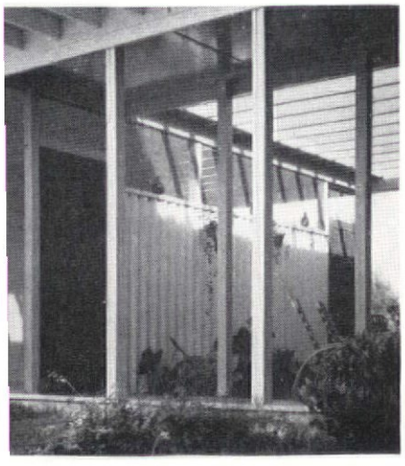
Cole: Storage walls are about the biggest sales feature in the house.

Builder: What tricks have you got for cutting costs?

Cole: Wherever you can, reduce the number of pieces in your house. A roof truss lets you reduce 140 pieces you have to push onto your plate down to 28. Use big sheets of plywood roof sheathing, full-size sheets of plasterboard on the ceiling instead of cutting and fitting around every partition. Put up your interior partitions in minutes instead of days by using prefabricated storage walls. Design the house to go up faster by keeping to a minimum the variations in sizes of doors, windows, cabinets and the lengths of structural lumber. Use factory-finished units wherever possible. Reduce overhead by speeding construction: a house should be roofed in four days after the foundation is finished (with the usual crew) instead of two or three weeks.



One of builder J. K. Stark's $13,000 houses designed by Cole for San Antonio.



The house above looks like a lot of value for the money because of its wide frontage. Detail at left illustrates how Cole has provided a breezway that also forms one side of a patio for outdoor living. This is representative of the attention he gives to outdoor living, as nearly every house has provisions for outdoor activities.

Cole the builder

Cole became a speculative builder as an important part of his education as a designer. He had strong ideas about how to design small houses and he thought he could do a better low-cost house than some he saw going up around Austin. But he wanted to check himself on methods, materials, costs and especially on some of his experimental ideas.

Already while at the University of Texas before the war he had begun the down-to-earth side of his training by working summers as a carpenter, roofer and plumber. His practical building education had gone on during the war when he spent three years with the Army Engineers, most of it in the South Pacific.

But there were many points he wanted to prove. So he put up a dozen houses of about 800 sq. ft. (plus carport) which he sold for a modest profit at $6,400. He proved to himself that his designs would sell, that his ideas on economy were sound and that the living rooms of his small houses were comparable in size and better designed than in many at twice the price.

For Cole-the-manufacturer the houses also were a laboratory. His prefabricated storage units, designed to replace entire partitions, were not load bearing. Cole had to design a floor plan to accommodate them as well as a new roof truss to cover them. Despite these innovations (of which more is said below) the houses were not only competitive in price but from $500 to $1,000 below other equal-size houses.

Cole also built houses in several different price classes, selling each at a profit, as well as a small apartment house. One night as he was figuring costs on a group of houses he had ready to sell he was jolted sharply when he discovered he was about to lose $1,000 on each house. To prevent anything like this from ever happening again he went back to

college to take night courses in accounting. Of even more significance, he took his smart young wife with him. She can now figure a set of housing costs as rapidly as he can. Now Cole has a sure-fire system of figuring costs which he passes on to builders.

Cole the designer

The best thing that can be said about Ned Cole's ability to design houses for builders is that once he has worked with a builder, he has never lost him as a client. His design talents are the center around which operate both Cole-the-builder and Cole-the-manufacturer.

The accompanying photographs illustrate a few of Cole's houses in different price ranges. The houses appeal to builders because they are several steps ahead of houses of the same price in the next block but they are not so extreme that they antagonize buyers.

From the outside they have a fresh, attractive appearance which people remember and come back to as they drive around a town looking for a house. Cole's houses tend to look larger than they are because they are low and have wider overhangs than most small houses. Window arrangements are good. While there is plenty of glass area, it does not consist of a large picture window facing the street. With fewer basic floor plans and fewer exterior plan variations than many developers use, a row of Cole's houses looks less as if all had been poured from the same mold. This is because he pays less attention to changing little gimmicks at the front door than he does to variation in the mass of the house.

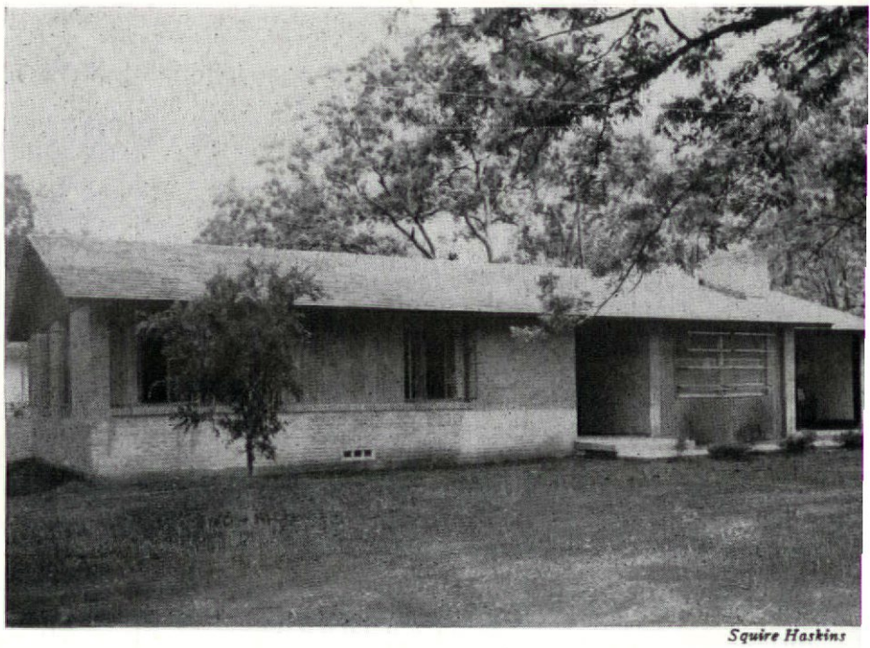
Most of his houses are in hot Texas, where people want light in their houses and a few large windows but also need good cross-ventilation and shade. When Cole pioneered his wide overhang on low-cost houses it was not only for appearance but because Texas houses need plenty of ventilation straight through the hot-weather rains. And the bigger overhang permitted bigger windows still shaded. In consequence, one of Cole's designs has been as widely copied in Texas as Levitt's expandable house has been in the Northeast.

The interiors of Cole's houses can best be described as having good livability for the money. Floor plans are carefully thought out. There is no waste space. Traffic arrangements are good. Cole's three children serve as a constant reminder to him that other people have children too, and he tries to plan accordingly.

Among the most striking elements in his smaller houses are the storage units, several of which are illustrated here. To find them in houses that have sold for $6,400 is a real shock to visitors used to the inadequate storage permitted in FHA minimum houses. They definitely give some big-house luxury to a small house, and yet Cole built his least expensive houses for only $6 per sq. ft. three years ago.

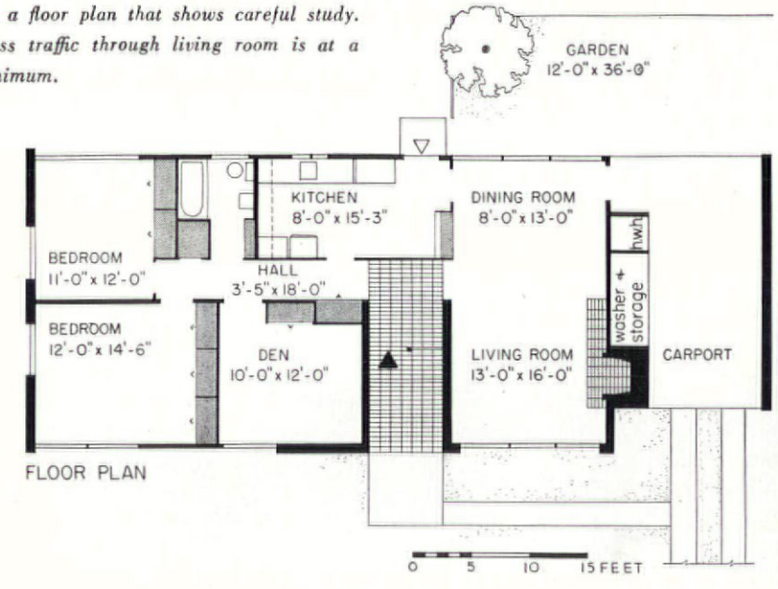
Perhaps Cole's most original idea is that a builder can replace a wall between two bedrooms (containing a closet for each room) with a Fabricon storage wall that costs no more money. Cole does not say that his cabinets are cheaper than a closet. He says they are as cheap as the closet with four walls around it plus the paint, shelves and labor.

This has been a tough idea to sell to builders. They agree that storage walls look better and sell houses but they are skeptical about costs. The story on how this resistance has been broken down comes properly under the heading of Cole the manufacturer; what the resistance has meant to Cole the architect is that he has virtually had to design the builder's house in order to get him to use the storage wall.

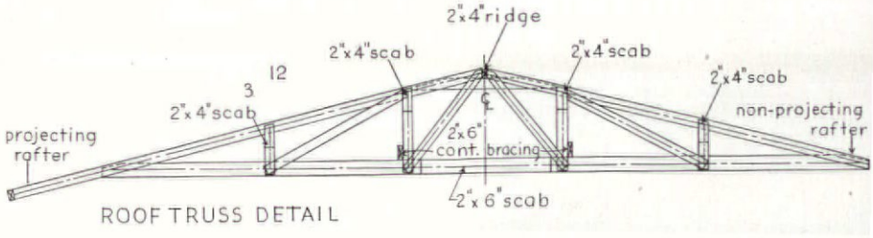


Squire Haskins

Approved by Southwest Research Quality House Division, this Dallas house has attracted considerable attention in the past few months. Selling for around $17,000, it has a floor plan that shows careful study. Cross traffic through living room is at a minimum.

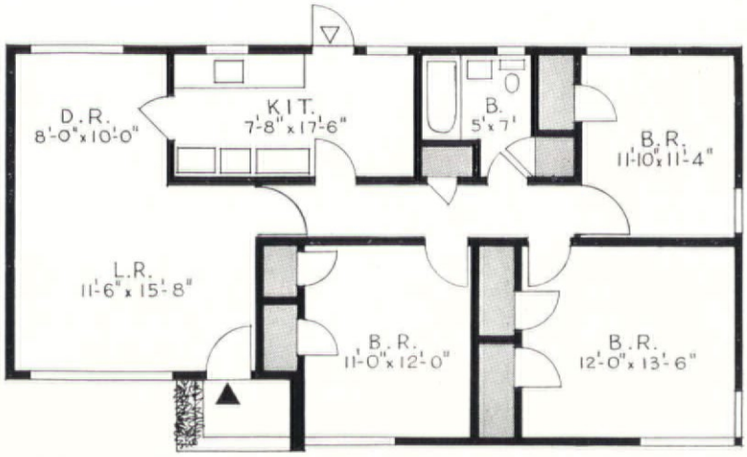


FLOOR PLAN

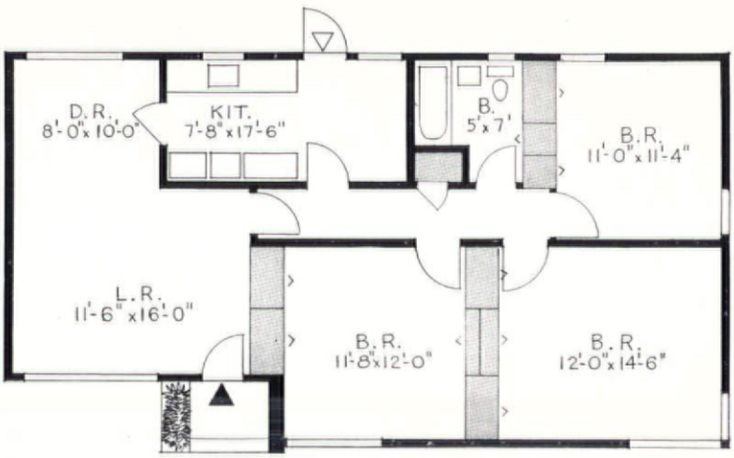


ROOF TRUSS DETAIL

Cole likes to use a roof truss for several reasons: it simplifies construction because it reduces the number of pieces to be pushed onto the plate from 140 to 28, labor to build a truss costs only $2, a truss lets the entire ceiling area be covered with full-sized sheets of plasterboard instead of cutting and fitting around each partition and it gives Cole a freedom to use his storage walls.

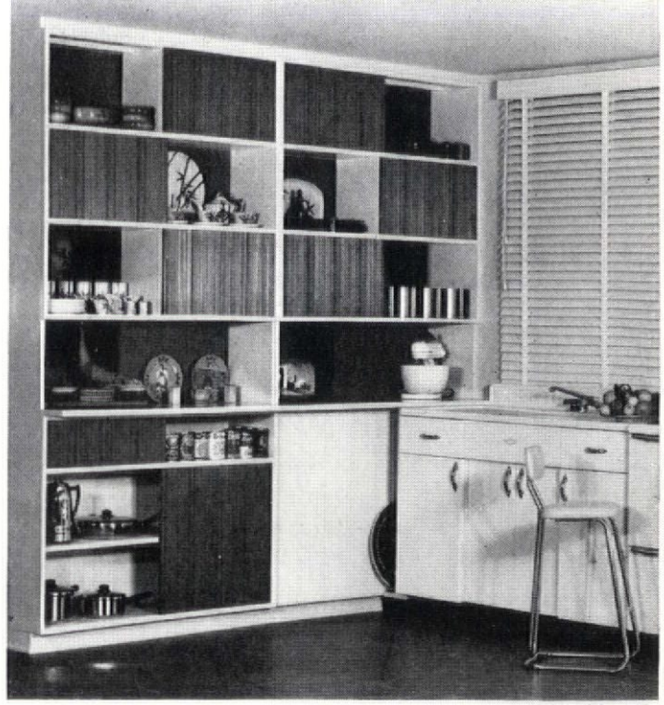


CONVENTIONAL



DESIGNED BY COLE FOR HIS STORAGE WALLS

The two floor plans above show two houses with the same outside dimensions but with different bedroom and living room sizes. A house using Cole's Fabricon storage walls actually gives a room slightly more space than where standard partitions with closets are used. The absence of swinging closet doors also gives more usable space.



Felder Photo Co.

Photographs above and to the right are opposite sides of the same storage wall. Sliding plywood doors permit cabinet to be used as a pass-through.



Felder Photo Co.

Prefabricated cabinets are made in a variety of designs which can be used together for different purposes. They are always factory finished, and come in a variety of colors.

Cole's architectural services to builders cover a wide range of choice, beginning with simple plans and a bill of materials for which he charges 2½%. For the full treatment he charges 7%. If a builder hasn't a good bookkeeping system, Cole's CPA sets one up. "It's for our own selfish reasons," says Cole. "We can't argue without a complete set of figures —their figures." Cole's fees are modest, a compromise between what he thinks he should get and what builders will pay. Last year the design service grossed $250,000.

Cole the manufacturer

Cole-the-manufacturer was a logical development of Cole-the-designer. His basic ideas on improving house design led to simplifying interiors, and simplifying interiors led to storage walls. Yet there were no cabinets on the market of the kind he wanted. He believed that they could be made better and less expensively than furniture makers would do it.

So Cole and three other veterans formed a company. Cole designed the cabinets and put in more than his share of the capital so he became the president. Harold Cadwallader took over the sales department and Walt Watkins ran the factory. Wm. C. Baker has now gone back to the Air Force.

The young partners cast their own cement blocks to save money and acted as their own masons. Today a cement block next to the office entrance bears this inscription: "Fabricon—built by four soldiers with their bare hands."

Since those first days a measure of prosperity has come and the factory walls have been pushed out in three directions. The 40,000 sq. ft. of space have been well stocked with machinery and efficient production methods worked out.

The real obstacle, as already suggested, has been sales resistance. Storage walls don't support the roof; and that kind of a "closet" is not too easy to sell a builder. Cole and Cadwallader have two ways out. 1) Along with the cabinets they can sell a floor plan that puts all the load on *other* load-bearing partitions. 2) Again—and this is preferred by Cole —along with the cabinets they can sell the idea of a trussed roof that carries all the weight to the exterior walls.

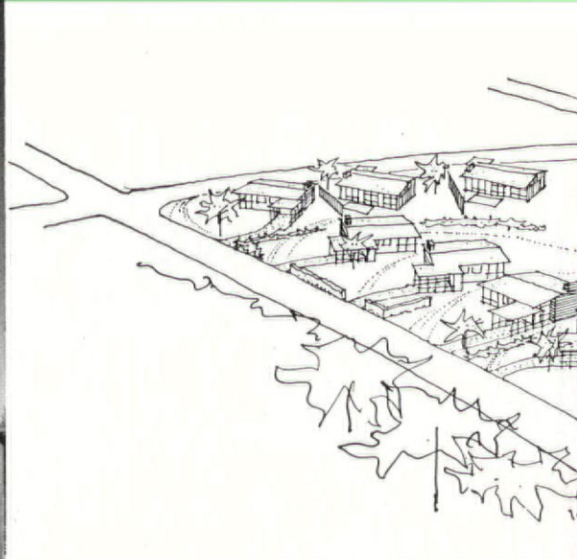
Builder-customers have been divided on the question of which method they prefer but about 80% use the truss.

Walter Steves, a San Antonio builder who has used many of Cole's designs says, "We feel that we gain rather than lose, by redesigning the interior to avoid the use of load-bearing partitions. We get our roof on much faster, dry wall construction is completed much faster and finishing is done with a minimum of trim work."

Steves adds: "By incorporating Cole's ideas into our speculative house building program we feel that we produce a house that far exceeds those of our competitors. The simplicity of his plans facilitates construction, both in materials

(Continued on page 240)





Photos: Robert C. Lautman

BUILDER-ARCHITECT TEAMWORK PAYS OFF

Step from colonial to contemporary takes the Lurias of Washington into a faster market

LOCATION: Fairfax County, Virginia
NICHOLAS SATTERLEE and FRANCIS D. LETHBRIDGE, Architects
LURIA BROTHERS, Builders

Gerald and Eli Luria are sons of an Arlington, Va. builder and have already put up several groups of colonial houses around Washington, D. C. Last year they decided to do something better than the rows of monotonous suburban houses that threatened to glut the market. They wanted a contemporary house planned for efficient, economical construction and something that could be varied throughout a development as simply as possible.

In searching for designers they found Nicholas Satterlee and Francis D. Lethbridge (of the firm of Keyes, Smith, Satterlee & Lethbridge) and the teamwork resulting from this architect-builder combination has been a happy, profitable affair for both sides.

For their 90 acre site in the Holmes Run section of Fairfax County, Va., which is about 11 miles from downtown Washington, the architects have drawn up a pleasant basic design that has many of the qualities of a larger house.

A basic 1-story house is 24′ 4″ x 36′ (902 sq. ft.) plus a carport with outside storage space. For $13,750 a buyer gets a fine lot of from 10,000 to 15,000 sq. ft. that is sodded and landscaped, has a concrete driveway and all utilities. The house has insulated sidewalls and roof, full kitchen equipment, a fine floor plan and an unusual amount of well-planned storage space with sliding doors.

Because considerable of the property is on sloping ground the architects drew up two versions of a 2-story house, the upper floor of which is essential the same as the 1-story design. In some, the lower level has 2 rooms plus a garage. Others have 3 rooms below with an outside carport. Two-story houses sell for $16,900 and $17,450 and have enclosed space of 1,804 sq. ft.

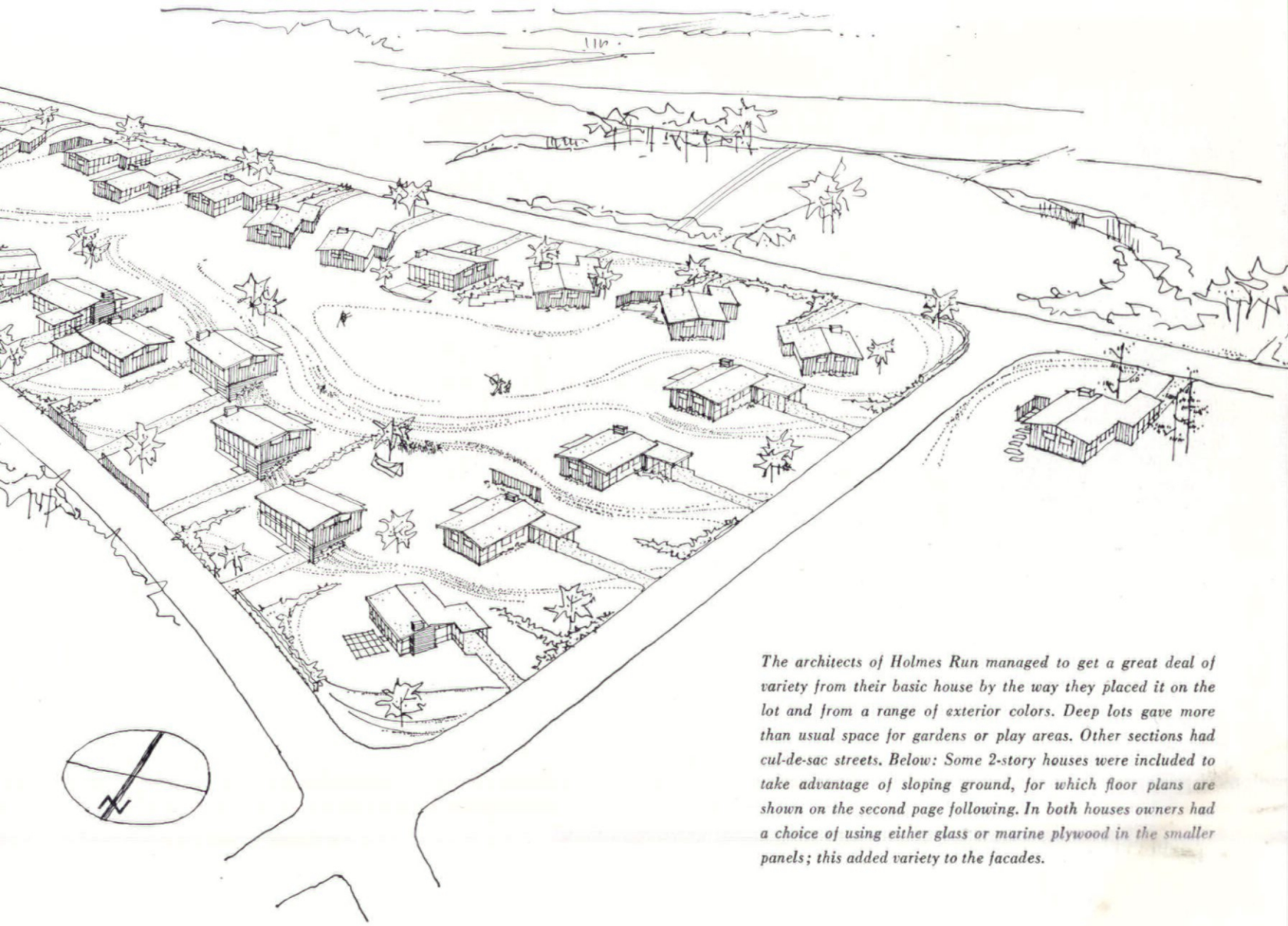
Somewhat to their surprise and definitely to their gratification the Luria brothers are discovering that buying a complete architectural service is a better investment than their former habit of purchasing a set of plans. It undoubtedly costs more, but it pays for itself.

The Lurias are finding out that architectural service includes:

- *Plans for a fresh, attractive salable house.*
- *A basic floor plan with variations that avoid monotony and that suit different size families.*
- *A 1-story plan easily adaptable to a 2-story house.*
- *Site planning that pleased the buyers but so efficient it saved the builders considerable money.*
- *Color schemes that give an original touch to the whole development.*
- *Such valuable by-products as smoothing out problems with FHA; help with advertising; skillfull on-the-job supervision; a design that won Southwest Research Institute's approval*

A flexible floor plan

The 1-story house is essentially a 2-bedroom house that can be turned into three bedrooms. An 8′ x 11′ alcove at one end of the living room (marked "study" on the floor



The architects of Holmes Run managed to get a great deal of variety from their basic house by the way they placed it on the lot and from a range of exterior colors. Deep lots gave more than usual space for gardens or play areas. Other sections had cul-de-sac streets. Below: Some 2-story houses were included to take advantage of sloping ground, for which floor plans are shown on the second page following. In both houses owners had a choice of using either glass or marine plywood in the smaller panels; this added variety to the facades.

plan on the next spread of pages) can be used as part of the living room by turning a storage wall on casters back against an inside partition. This has been done for the photograph on the next page.

By swinging the storage wall out to face the living room, the space behind it can be made usable for a study or a third bedroom. If owners wish, a door can be installed and also the area above the storage wall can be filled in solidly. Giving an owner this choice lets him use the living room and the study together as one large room for parties, or again for a study or sewing room as long as the owner wants it, yet provides a room for a second child when the time comes.

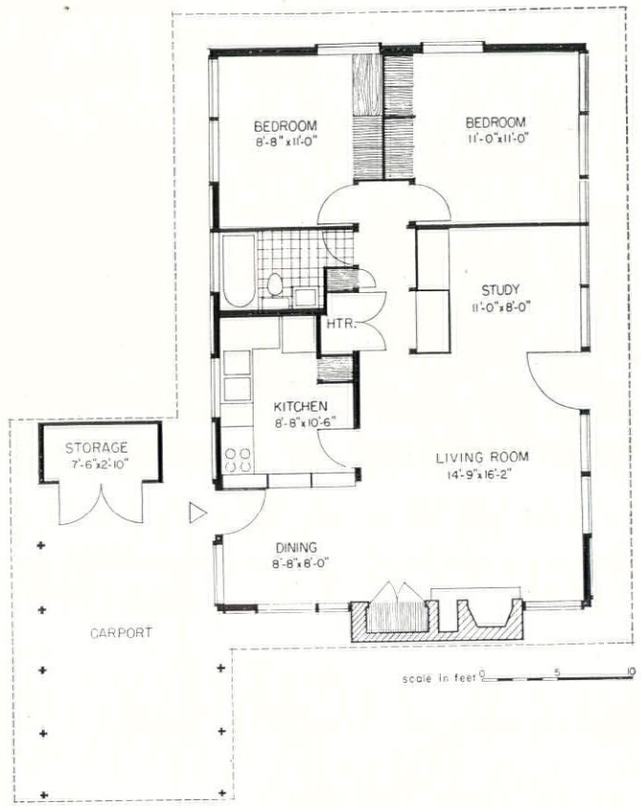
It may be of some significance that almost none of the buyers want the two rooms thrown together. About half want the study closed in so the room can be completely private and half want the storage wall shutting off the study but open at top and one side.

Part of the attractiveness of the house results from the feeling of extra height given by the sloping plank and beam ceiling. This feeling of extra space is helped out by the open, L-shaped living and dining room and further by the large windows, planned so they give a view away from the street. None of the large windows face the street except for houses on corner lots.

Another feature popular with buyers is that a door opens from the living room to an outside area that can be furnished as a garden or a patio. The model house, used for







This plan and photograph show how the living room looks when it is combined with the study. The large, movable storage wall can be swung out to face the room, creating a study or bedroom area

sales and photographic purposes, has the patio fenced in to serve as an additional outdoor room that can be used for about nine months a year in Washington's mild climate.

A masonry wall big enough for a fireplace (with a flagstone hearth) and a large storage closet is also a selling asset for the house (though the masonry wall is a little heavy looking on the outside).

The kitchen is compact and well planned. It is equipped with sink, garbage disposer, range and refrigerator plus cabinets. With only one door to use up wall space, there is 27′ of walls for cabinets or equipment. There is not space for a table in the kitchen but a pass-through counter connects kitchen and dining room to save work for the housewife.

Architects sited individual houses

In locating individual houses on the lots the Lurias feel that Satterlee and Lethbridge have done a particularly fine job. Each house is individually positioned with regard to street, neighbors, terrain, climate factors and so that even excavation labor can be saved where possible. In fact the builders saved considerable money by not having to push the usual amount of dirt from place to place.

So well did the architects do the lot arrangement that in one area four extra houses were included. The profit on these houses will more than pay the architectural fees.

Because houses are on large lots on curving streets and slightly rolling land, the architects had a chance to use considerable judgment and to achieve a feeling that few developments ever get.

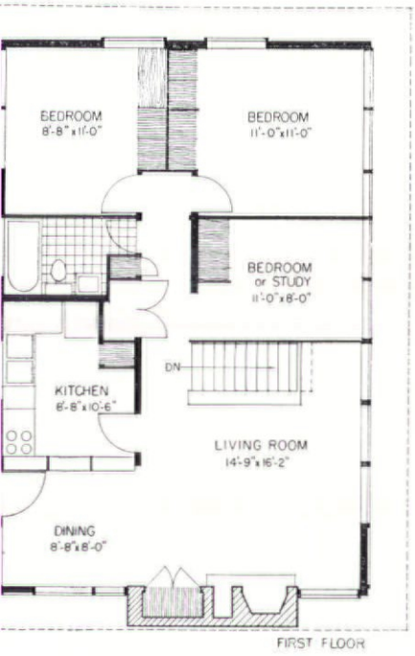
Variety throughout the development is attained by shifting the position of houses on the lots, putting carports in different positions, by using 2-story houses where advantageous, and by varying the street patterns. Some areas are cut by streets into approximately rectangular blocks; others are arranged with *cul de sac* streets and play areas of 1/3 acre in the center of the loop. The fact that lots are of different size and shapes is an important factor in the general attractiveness of Holmes Run.

As seen in the perspective sketch on the preceding page, some of the blocks have a large area left open in the center. It can be turned into a valuable community asset if owners do not cut it up with hedges or fences. The Lurias hope to pursuade owners to handle this open space for the best interests of everyone.

(Continued on page 238)



A sloping plank-and-beam ceiling seems to make the rooms larger and the stained finish combines well with natural finishes on other surfaces. To the right is the kitchen door and a glimpse of pass-through to dining room. Large fireplace is a sales asset.

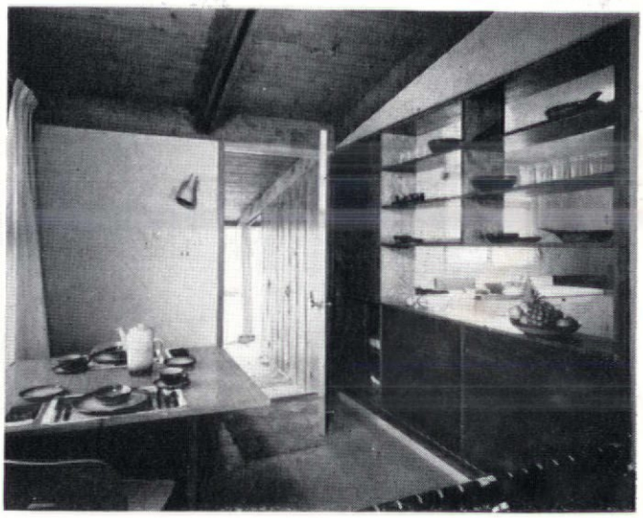


FIRST FLOOR

Right: Dining room with main entrance door leading out to carport. Pass-through is unusually large.

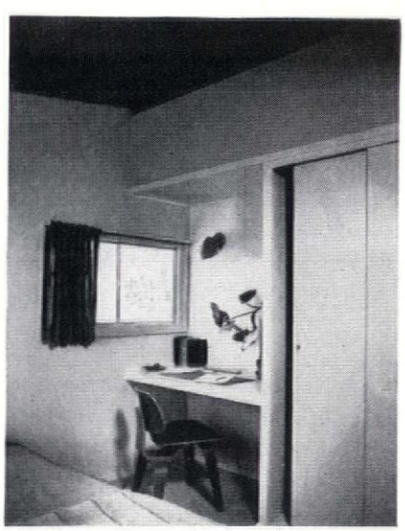
Left: upper floor plan of 2-story house which is generally similar to 1-story plan except for stairway and fact that study is closed off from living room.

Left below: ground floor of 2-story house. An alternate plan has outside carport, and garage space shown here becomes an additional room.

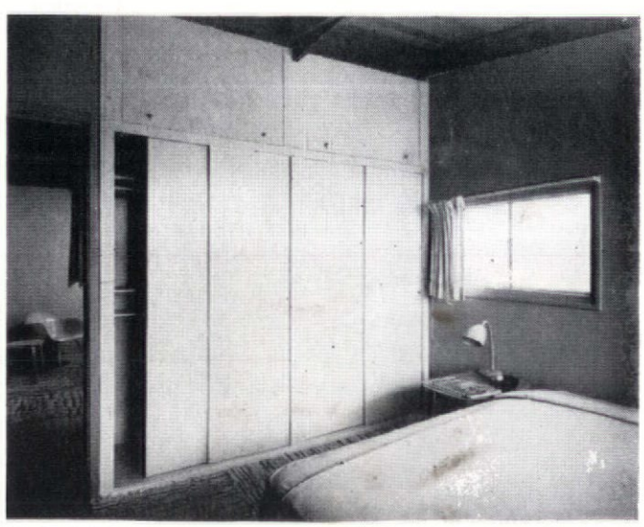




BASEMENT



View of two bedrooms showing excellent storage facilities: well-built cabinets with sliding doors and considerable space. Most windows in house are sliding aluminum.





THE AMERICAN BARN

Its varied forms st

and cultures of this country

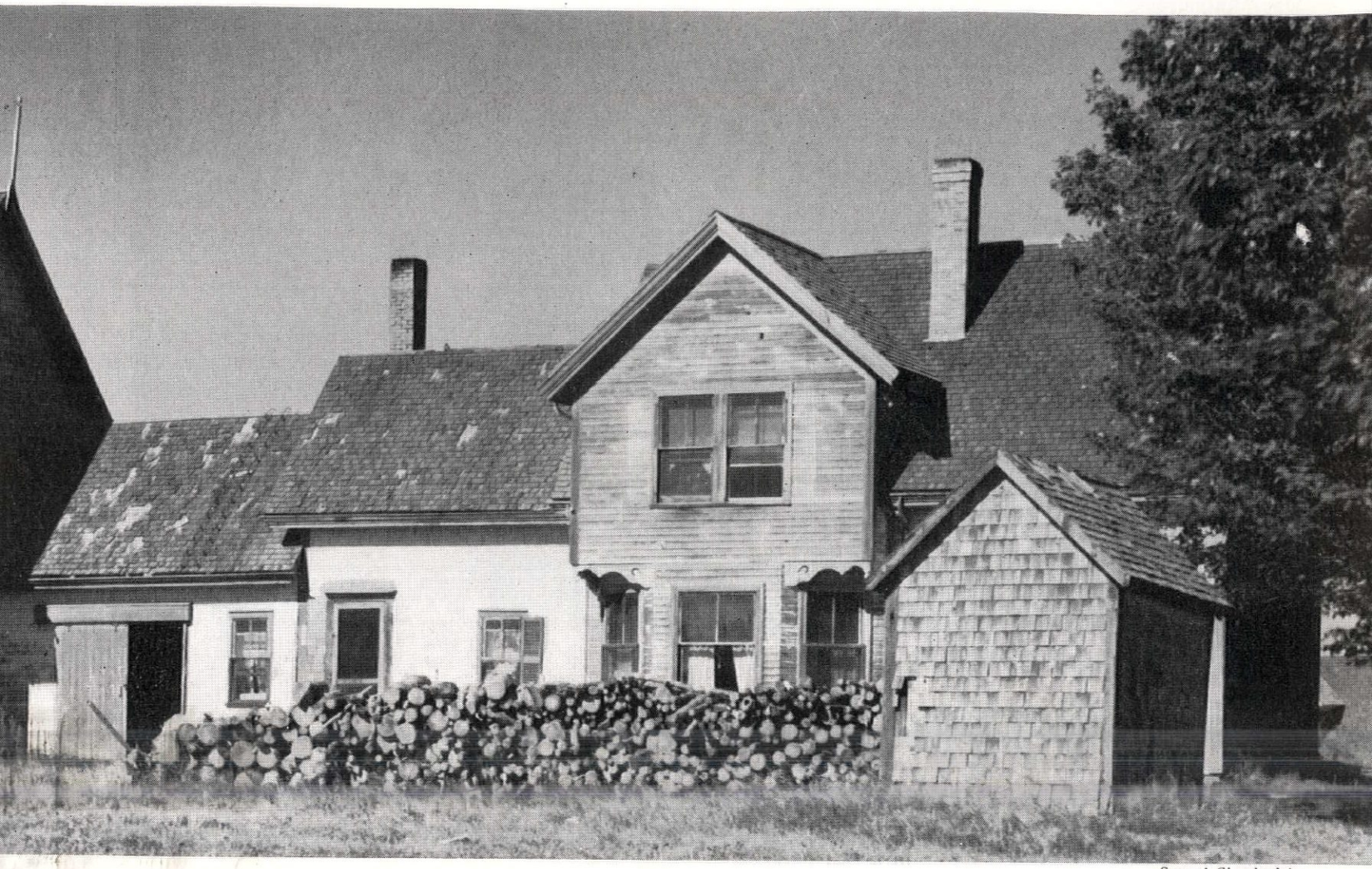
The barn has so long been admired by architects as a forthright expression of purpose and structure that it comes as a shock to realize how rapidly our beautiful barns are growing obsolete. The conditions that created them have silently disappeared, nudged out by new industrial processes that have insidiously penetrated farming. Those who continue to build barns as they did before, are most of them only burdening themselves with inevitable debt. The love that we give to the romantic barn is given to a departed spirit whose image lingers on.

At a time when the whole problem of the barn has to be thought out afresh it is profitable to re-examine the virtues in our historical barns. Chief among these has been the barn's singleness of purpose: it has ever been just a tool for farming with. A good barn always fits the crop, the climate, the means of cultivation, and the market. It has been made of the most appropriate materials available and by means of the handiest tools.

The barns built in the 17th and 18th Centuries were good barns. Colonial design was geared to a primitive husbandry with the hoe or the wooden plow and perhaps a yoke of sturdy oxen. They were built of massive timbers, cut with axe and adze from the then abundant forests or of local stone available for the hoisting. The market for their crops, in most cases was the family itself: the unit of both production and consumption.

Today through many parts of America farming has changed from a small family enterprise into a big and specialized business, mechanized to meet the demands of the American mass market. Over what was once wilderness and desolate prairie, the giant combine harvests wheat, the airplane sprays insecticide over miles of corn, and the locomotive rushes cattle, hogs, and milk to overcrowded cities. The oak trees are gone from the farmer's back acres, and factories are producing substitutes of corrugated sheet metal and prefabricated plywood trusses.

In the face of the revolution in agricultural methods and in techniques of construction, most American barn buildings have changed very little. Mechanization, the most important factor in 20th Century farming, has merely been incorporated in the old shapes, sometimes twisting them beyond recognition but seldom attacking the problem anew.



Samuel Chamberlain

eflect the crops, climates

olonial past —By Mary Mix Foley

Severe winters produced the typical New England barn with inside access to house through woodshed and summer kitchen. Abbott farmhouse in Andover, Mass. (right) was built in 1685; later shingled barn (above) is in Machias, Maine.

H.A.B.S.

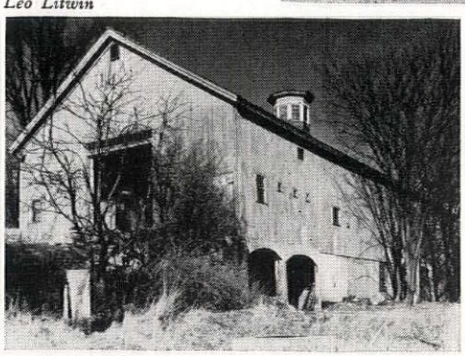


The colonial farmer would never have been caught so sentimentally oblivious of how much rent a cow can pay. The traditional barn was always built to fit its region.

Faced with a bitter northern winter the canny Yankee, for example, qualified known models, devised interconnected barns and houses to avoid venturing out of doors. The group settlement of New England reinforced this compact style. Houses and barns, on small lots, were clustered together in the village, with land for tillage lying farther out. On a limited building area, continuous construction thus provided more free ground. The barn was often set at right angles to the sheds to form a sheltered cattle yard. Sturdy yet simple construction was the rule, since the neighbors rather than carpenters helped to raise the barn.

The tight, convenient and thrifty New England design is the offspring of a rectangular English brick barn which the colonist translated into wood for lack of brick. The shape, however, remained virtually unchanged. Similar Englishmen, who settled in the hot, enervating climate of Virginia's Tidewater plantations, developed a barn shape which can hardly be recognized as stemming from the same source.

Leo Litwin



Barns grew larger when crops for trade supplemented subsistence farming. This one, in Groton, Mass., retains the English arch, includes ribbon lights like those found above the earliest colonial doorways.



A Connecticut colonist reproduced 17th Century English brick barn in wood, complete to arched doorways.

H.A.B.S.



HUDSON RIVER VALLEY



Verplanck-Van Wyck barn, Dutchess County, New York, early 18th Century

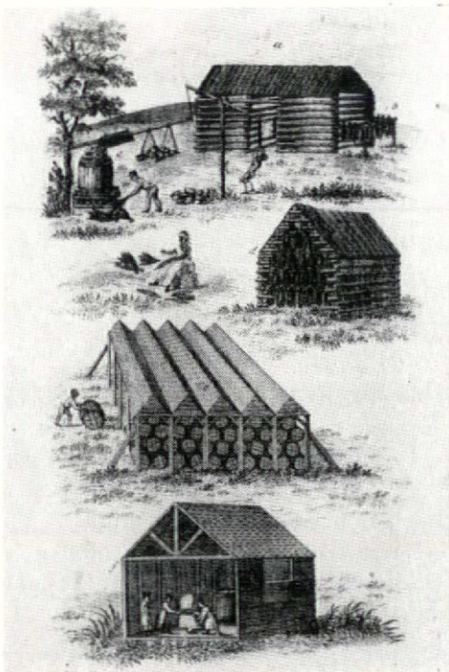
Between New England and the South lay a region of temperate climate, settled by a diversity of nationalities and religions. The Hollanders in New Netherland built low and broad. The spread of their barn roof, the short side walls and the second story overhang are typically Dutch and typically colonial. Construction followed that of the Frisian barns in Holland, with a double row of posts supporting the long roof span. The overhang, which here provides added storage space for hay, is a translation from medieval town houses which overhung narrow streets. In early use, the barns probably combined living quarters with stables, as did their Frisian antecedents. This arrangement, with animals and humans at opposite ends of a long structure, was a fortuitous solution to isolated frontier settlement. Later the barn was enlarged simply by moving the family out of it.

TIDEWATER VIRGINIA AND MARYLAND

Specialized tobacco culture ruled the Tidewater South for nearly 200 years. The sultry climate, the early development of the river front plantation and the scarcity of labor before the introduction of slavery, all contributed to the design of the barn. Hand cultivation with the hoe was universal, and a few acres at a time were cropped until worn out. Barns were always far from the house, placed adjacent to the tobacco fields, and new ones were built as new fields were opened up. The barns were therefore comparatively flimsy. The sharp peak, which provides a high, ventilated space, was criss-crossed with scaffolding for hanging tobacco sticks and at least one side of the barn was left open for ventilation. The shady shed extensions, the cone-shaped roof and the weathered, gray wall planking are distinctly southern and give the barn its unique Tidewater flavor.

Cross Manor tobacco barn near St. Mary's City on the Potomac, built circa 1643

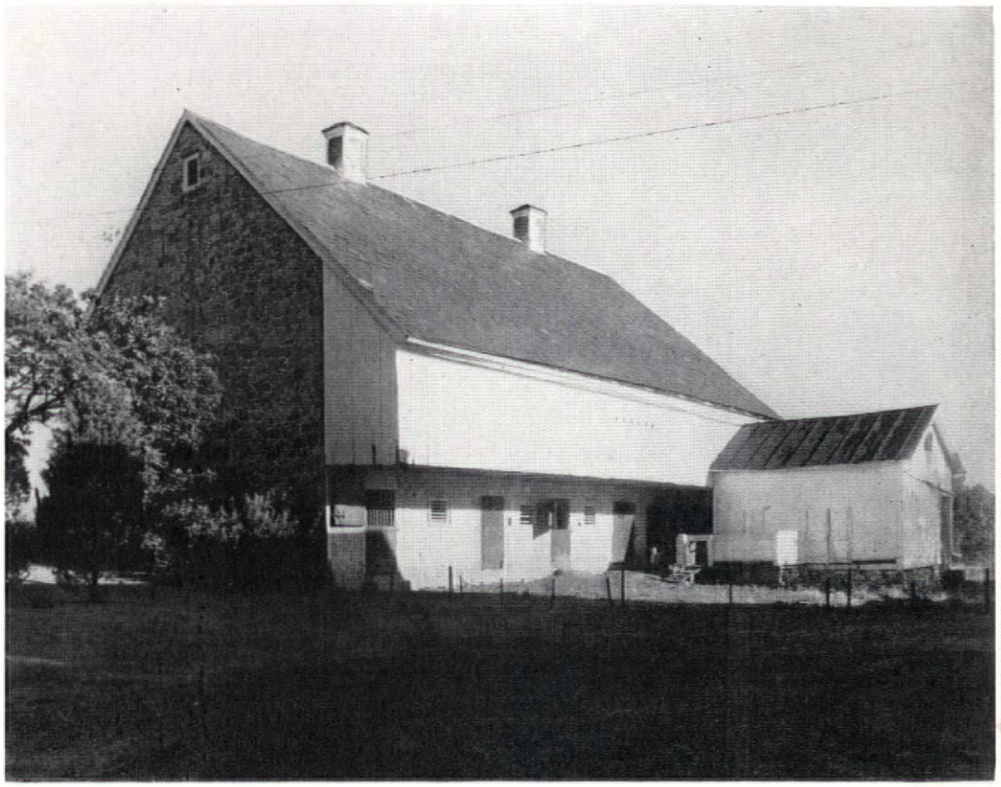




These early Virginia sheds were favored for quick, crude construction. Upper two are of notched logs with space left between for ventilation. Joists were inserted at 4 ft. intervals for hanging tobacco. Third type is post, stud and clapboard.

Photos: (top) Holland Society of N. Y.; (left) E. H. Pickering, H.A.B.S.



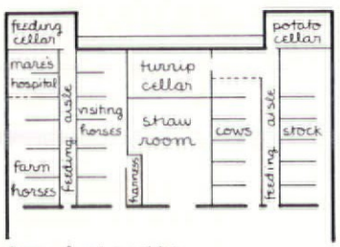


The Pennsylvania German takes pride in his manicured acres and huge bank barn. Built on a slope, the barns stable livestock at the lower level, with mow and threshing floor above. "Der Vorschusz," the cantilevered forebay, adds space to the upper story, shelters animals from rain and sun. This barn, near Bird-In-Hand, was built in 1770, is still in everyday use. It is typical of the undecorated barns of Lancaster County where Amish "Plain People" frown on fancy show. Old Order Amish (above) still farm with horses and put even the youngest children quickly to work.

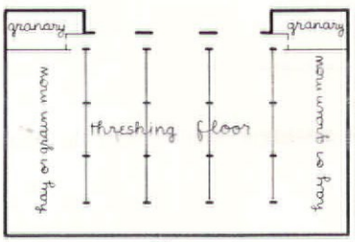
The Pennsylvania German still builds successfully in a style which has remained almost unchanged since colonial days. But his society has also remained largely stationary, a backwater (albeit a prosperous one) cut off from much of 20th Century civilization. The massive barns, for which the Pennsylvania farmer is famous, are still pegged together; the axe, adze and saw are common building tools; community barn raisings are still major social events. For over 200 years this clannish, farming society has retained its customs, language and handcraft methods of building.

The huge bank barns which reflect a continuing folk culture within industrial America, are a development from early Swiss barn-houses. Stock was stabled on the stone lower level, projecting into a bank for warmth, with family quarters in a timber upper structure. After the first pioneering generation, the barn was separated from the house.

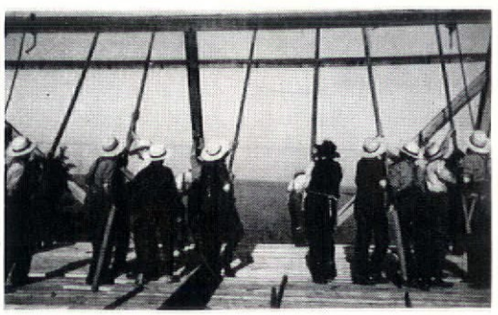
Perhaps the outstanding fact about the Pennsylvania Germans is that they, alone among American colonists, brought with them a strong, peasant farming tradition. Moreover, they settled in an area much like the Germany from which they migrated. There was no sharp break in occupation or environment. This, coupled with their strict religious sects, which demand a rural way of life, conspired to preserve their early culture. Among the most conservative are the bearded, black-clad Old Order Amish, descendants of the Swiss Brethren who learned their farming methods as religious refugees in the German Palatinate. Forbidden to own property, they were set to work on worn out acres, soon becoming famous for reclamation of ruined land. In America, while other settlers were still cropping land to exhaustion, the German immigrants increased the fertility of their soil with crop rotation and systematic fertilizing. From a modest goal of self-sufficient farming, their yields became so plentiful that surpluses were sold, with wheat and later tobacco constituting a money crop. But profits were turned back into the great barns, standing as solid and four-square as their sturdy Dutch owners.



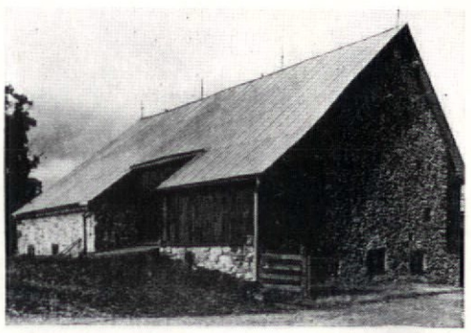
tower level (stable)



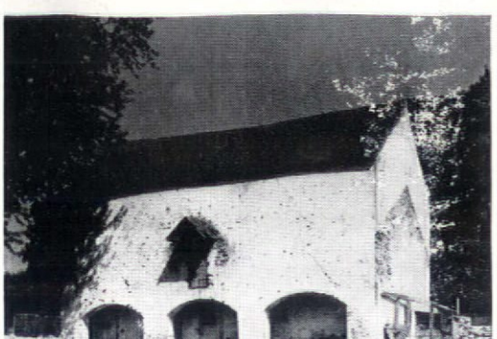
bank entrance floor



Barn raisings are still an Amish custom. Here the first span goes up, pushed by long pike poles and controlled by ropes at either end.

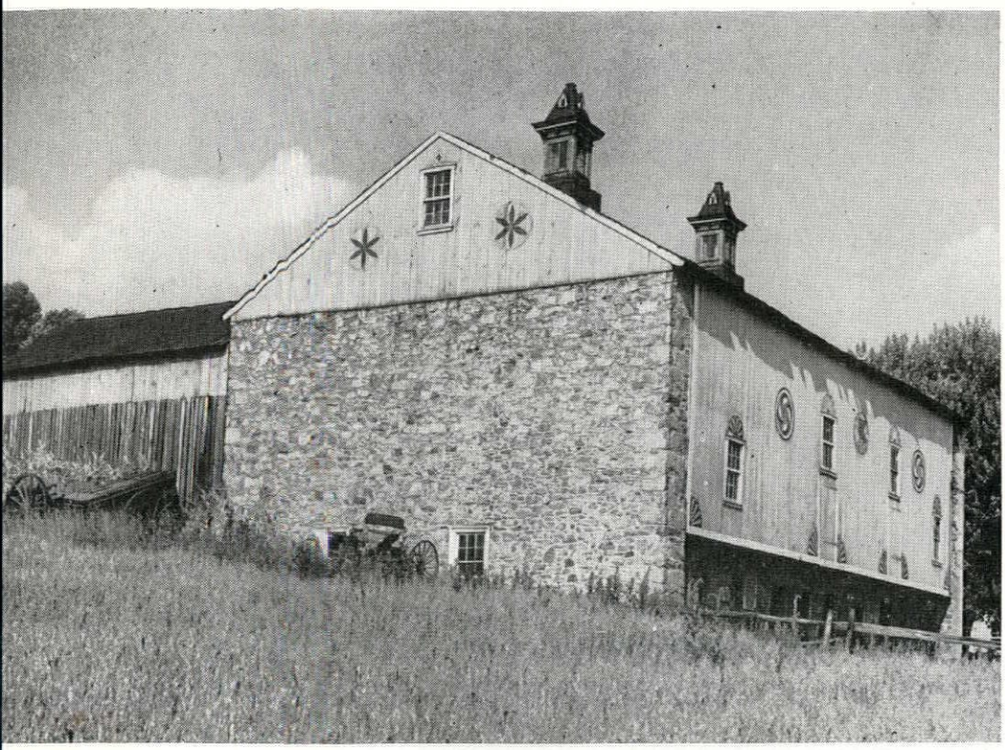


"Die Scheier-Brick," the barn bridge, leads to threshing floor whose massive timbers easily support a loaded wagon.



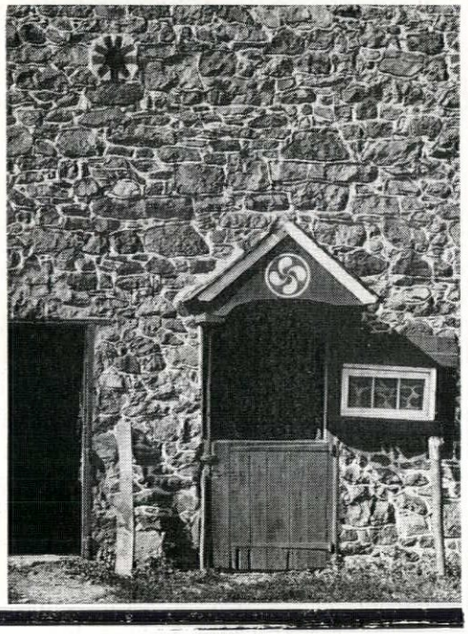
A rare Pennsylvania barn solves with unusual arches the problems of space and shelter which produced the forebay.

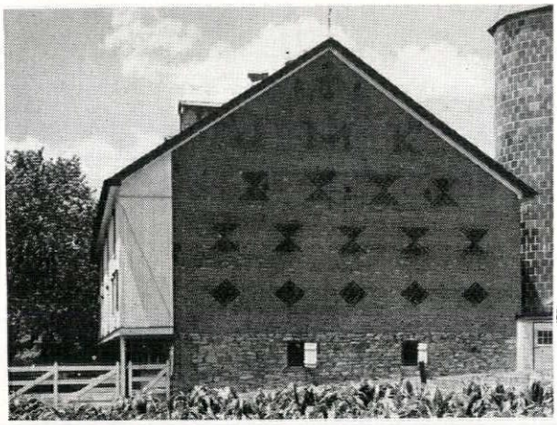
Photos: Charles S. Rice and



Barns were first painted when replacing timbers became more expensive than protecting them. Typical red barn decorated with "Blumme-stern" (star flowers) then appeared. "Hexefuss" was magic triangle cut into barn lintels for good luck.

"'S Vordach," the gabled doorway hood, was copied from 17th Century German house doors. Note brick voussoirs which outline ventilating portholes set in the stone end walls.

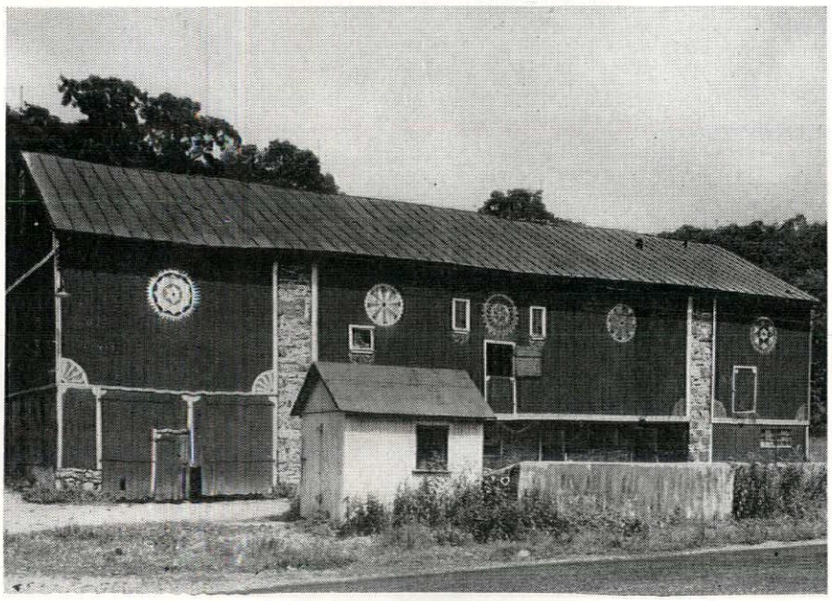


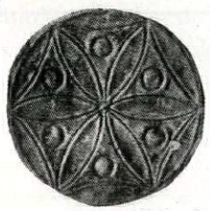


Ingenious openwork doubles as decoration and ventilation. Brick was not used for the end walls of barns until after 1850.

Original small barn was enlarged with additions at either end, and embellished with intricate elaborations of the early symbols. Typical small milk house still stands in its characteristic position.

Photos: (top) FSA; (below & r.) Charles Dornbusch, Pa. German Folklore Society; (symbol) Ohio State Archaeological & Historical Quarterly



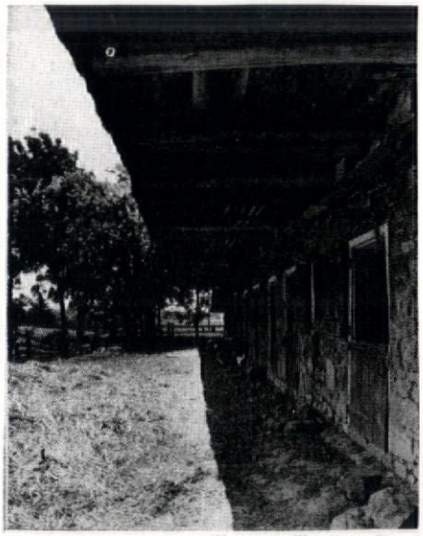


The "hex" signs* for which Pennsylvania is famous are a unique American addition to the barn. They first appeared after 1840 when the machine age began to destroy home crafts. From a traditional place on linens, plates, dower chests and tombstones, the simplest designs were shifted to the barn. The fact that they do not appear on Amish barns, despite their use on household articles, reveals both a disapproval of public display and a continuing tradition of making goods at home. Although decorated barns are comparatively new, the symbols themselves are ancient folk designs, predating the alphabet, and recognized as part of the cult of sun-worship which ruled pre-Christian Europe for over 1,500 years. The six-pointed compass star is found on a Mycenaean gold disk (above) made about 1550 B.C., and the revolving swastika on a Roman stone quarry by German laborers. These round and radiating symbols of a forgotten religion have been preserved by the clannish Germans from their ancient peasant culture. Originally representing the power of the sun over seasons, crops and life, they are particularly appropriate to the Pennsylvania Dutchman who still consults the signs of the zodiac at planting time.

*A name first incorrectly applied to barn symbols by a New England historian.



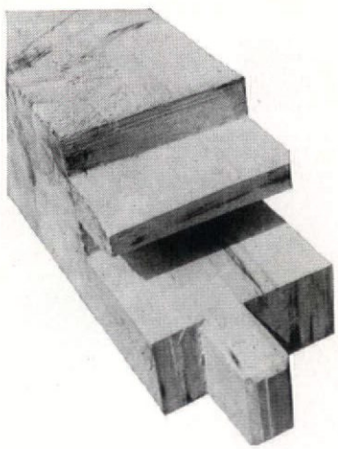


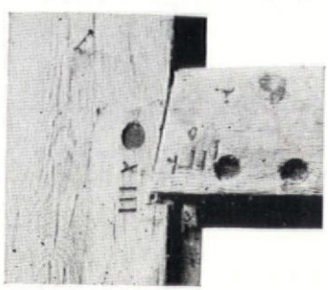


Photos: Charles Dornbusch; G. & M. Heilman; Charles S. Rice

The Old Order Amish have no churches, conduct ceremonies in house or barn. Right: nails are verboten, framework still secured with sturdy oaken pegs.

Cantilevered timbers carry weight of superstructure. Dutch doors pen animals while giving them light and air.



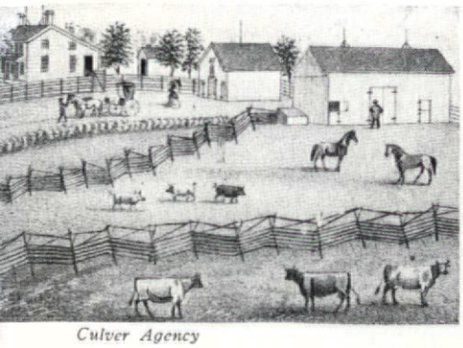


"Eesel fuus" (mule's foot) is one of complicated joints which guarantee the barn's strength. Members are pre-cut to exact size, matched by number.

Before the term was even invented, prefabrication was raised to a science in Pennsylvania. All wood members are precut and numbered, fitting together like a jigsaw puzzle when the community gathers on barn raising day. The only tools are hammers, pike poles and crow bars.

This extraordinary wood craftsmanship of the Pennsylvania German was undoubtedly an American development. Stone building is a deep-seated tradition in the Palatinate and accounts for the excellent stonework of his barns. The timber upper-structure stems from Switzerland. But there are no European barns just like the Pennsylvania Dutch. It remained for the immigrant to merge stone sides and timber cantilevering into brillant but simple construction.

In typical barns the front wall supports nothing, the entire structure resting on stone end walls and massive cantilevered timbers of the threshing floor. Two rows of posts and girders support these main rafters while intermediate columns and vertical struts support roof rafters above. The huge, main timbers are generally cut directly from a length of tree and are hewn on two faces only. The expert Dutchman can make his razor sharp adze cut a chip as big as a fist or a shaving paper-thin. The Pennsylvania German barn is not recommended to anyone less expert in handling tools.



Culver Agency



LIFE: Andreas Feininger

New Englanders in Illinois clung to their old barn shape, but abandoned continuous construction. House, stable and shed were split apart to suit specialized farming and a mild climate. On rich Iowa prairie modest New England box grew far beyond its original size.

Lester Jones



LIFE: Andreas Feininger

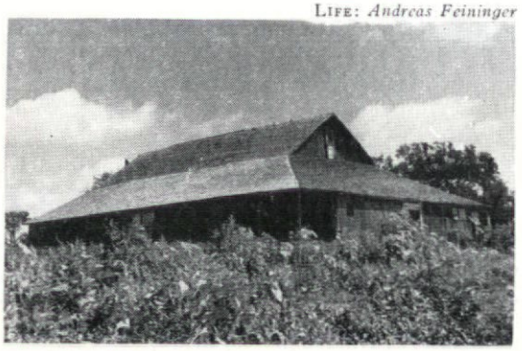


New Netherlands was occupied by the English in 1664, but their best barn shape persisted, and may be found as far West as Missouri, Iowa and even California, although direct migration cannot be proved. This mid-western shape could instead be a modification of the Tidewater barn, with the original angle of shed extensions erased by a straight roof.

I. T. Frary



LIFE: Andreas Feininger



Tidewater tobacco sheds are suggested by the high-peaked roof and sweeping sides of these North Carolina and Iowa stables. Note first floor structure (left) reminiscent of Virginia's log curing barn. Log sheds are still used for flue-curing tobacco in North Carolina.

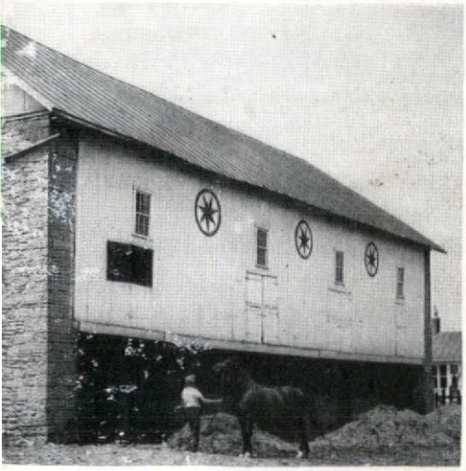
Throughout the midwest today one can still see the barn forms which crossed the country with 19th Century pioneers. The first barns were, of course, the log hut and a crude, post structure, built into a haystack for feed and warmth. But with settled farming the neat, New England box appeared, the spreading Tidewater shed and the sturdy Pennsylvania bank barn, transplanted by northern and southern settlers to the western territories. New immigrants from Germany and Scandinavia further augmented the variety of midwest styles with fresh barn forms from peasant Europe. Thus, there is not and never has been, a typical midwestern barn.

The heritage of many styles may still be plainly visible. But the barns of the middlewest are traditional with a difference. Settlement beyond the Appalachians was not like the colonial settlement of the Atlantic coastal plain. Large areas could be cultivated without clearing; improved farm machinery invited bold attacks on the stubborn, prairie sod. Bonanza farms, the "league-long furrow" and the transcontinental railroad encouraged expansion, trade and specialization. The several purposes of the barn were therefore split apart, producing separate stables, corn cribs and granaries. To the great stretches of open prairie, wood had to be shipped long distances, and a stark, minimal quality characterizes farm buildings on the plains. Where land was fattest and railroads most convenient, the eastern prototype grew to mammoth proportions. In 1900 the gambrel roof expanded storage space to the dimensions required for hay in large-scale, horse-powered farming. Commercial dairying enlarged the simple rectangle with jutting ells. These barns, derived from Colonial antecedents and adapted to 19th Century farming methods, are still being built today.

But for the past 30 years American farmers, particularly in the middle west, have faced a situation as unprecedented as that which confronted the Colonial settlers. This time the problem is not one of new climates and new soils. It is the problem of industrialization. Like the colonists who at first reproduced European building forms in a new environment, the modern farmer clings to barn designs developed before mechanization took command. The difficult challenge which the modern agricultural designer must meet can be simply stated: he must restore to the barn—but in an extremely complex environment—its efficiency as a tool for farming with.

(Part II, of this series, The Modern Barn, will appear in the September issue)

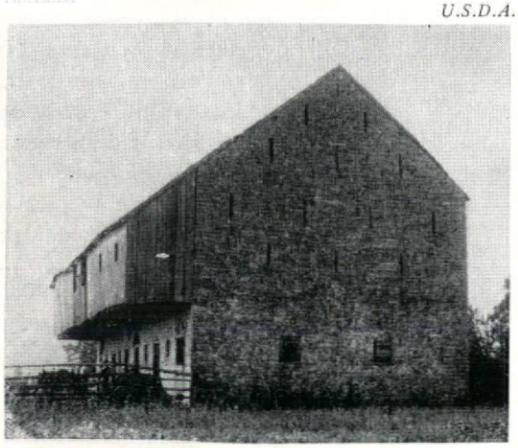
Cleveland Plain Dealer



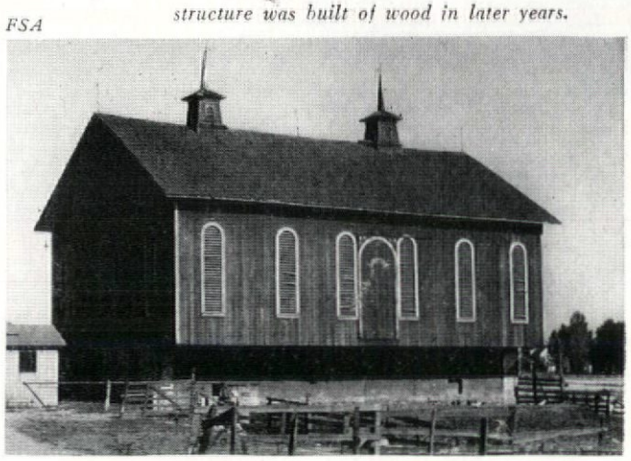
The Pennsylvania Dutch barn in Ohio relinquished masonry end walls for lack of stone, usually have a forebay.

Pennsylvania barns, little changed, mark the path of Germans mid-west. Early Maryland settlers retained typical ventilating slits which may have been used to shoot Indians.

U.S.D.A. FSA



On flat Ohio sites ramp was substituted for back entrance to upper level threshing floor. Ventilating shutters and painted archs are also found on Pennsylvania barns, especially when the entire structure was built of wood in later years.

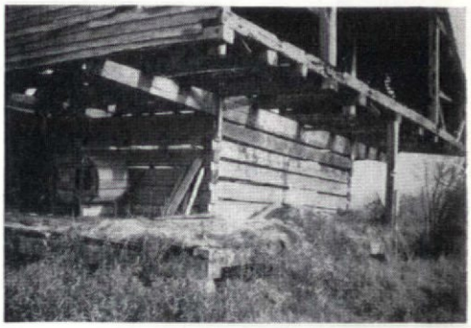




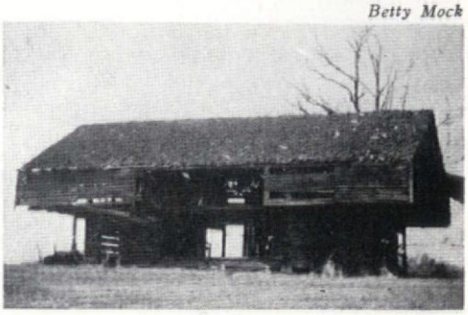
Leo Litwin

Deviations from the main barn type are found throughout the country. The round barn, designed to enclose the most space in the least wall area, proved expensive and complicated for both storage and stabling.

Cleveland Plain Dealer



Betty Mock



Tennessee barn has unique style which cantilevers upper story 10 ft. on all sides to form open cattle shelter in a hot climate. Central passage rises into haymow for easy unloading of wagon.

Scandinavian immigrants brought new barn shape to northern mid-west. Roof with steep pitch is excellent snow shedder.

Mercury Pictures



The Victorian era did not ignore the farm. With a final flurry of Gothic, this Ohio barn assumes almost the character of a cathedral. Original was undoubtedly the neat, uncluttered New England rectangle.

Louisiana: FSA



Gambrel roof and ells increased size of barn after 1900. Large and graceless design is now common throughout the mid-west.

Culver Service

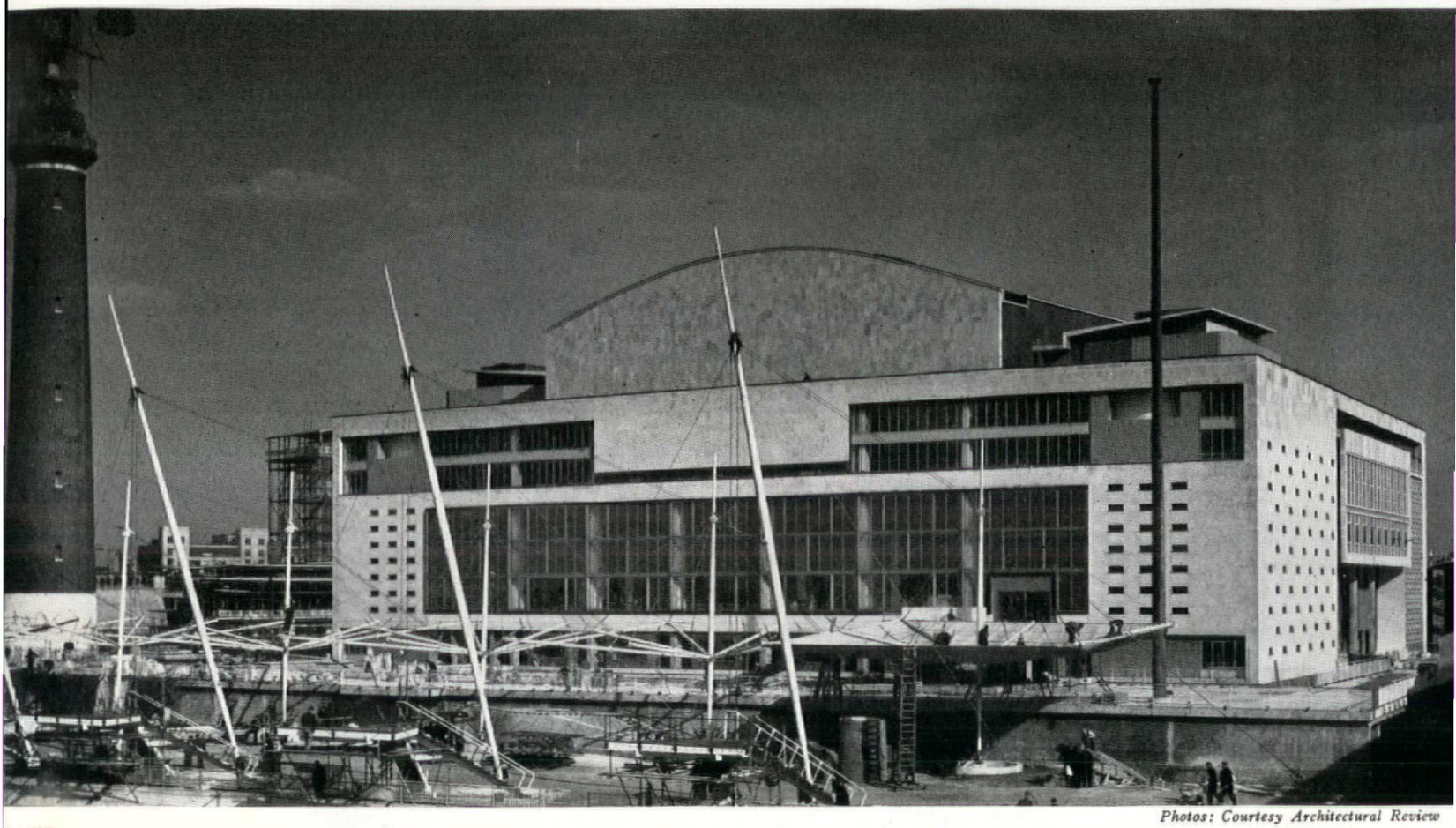


New Orleans fantasy links barn design to the flourishes of that city's iron grillwork. Dovecote in haymow adds another Gallic touch.



THE ROYAL FESTIVAL HALL

ROBERT H. MATTHEW and J. L. MARTIN, Architect and Deputy Architect



Photos: Courtesy Architectural Review

In two major respects the Royal Festival Hall in London ranks among the important buildings constructed since the end of the war: first, as an acoustic masterpiece (see Prof. Richard Bolt's analysis on p. 180); and, secondly, as a deliberate attempt to produce a permanent, modern, monumental work of architecture in a country whose standard in monuments has been second to no other's.

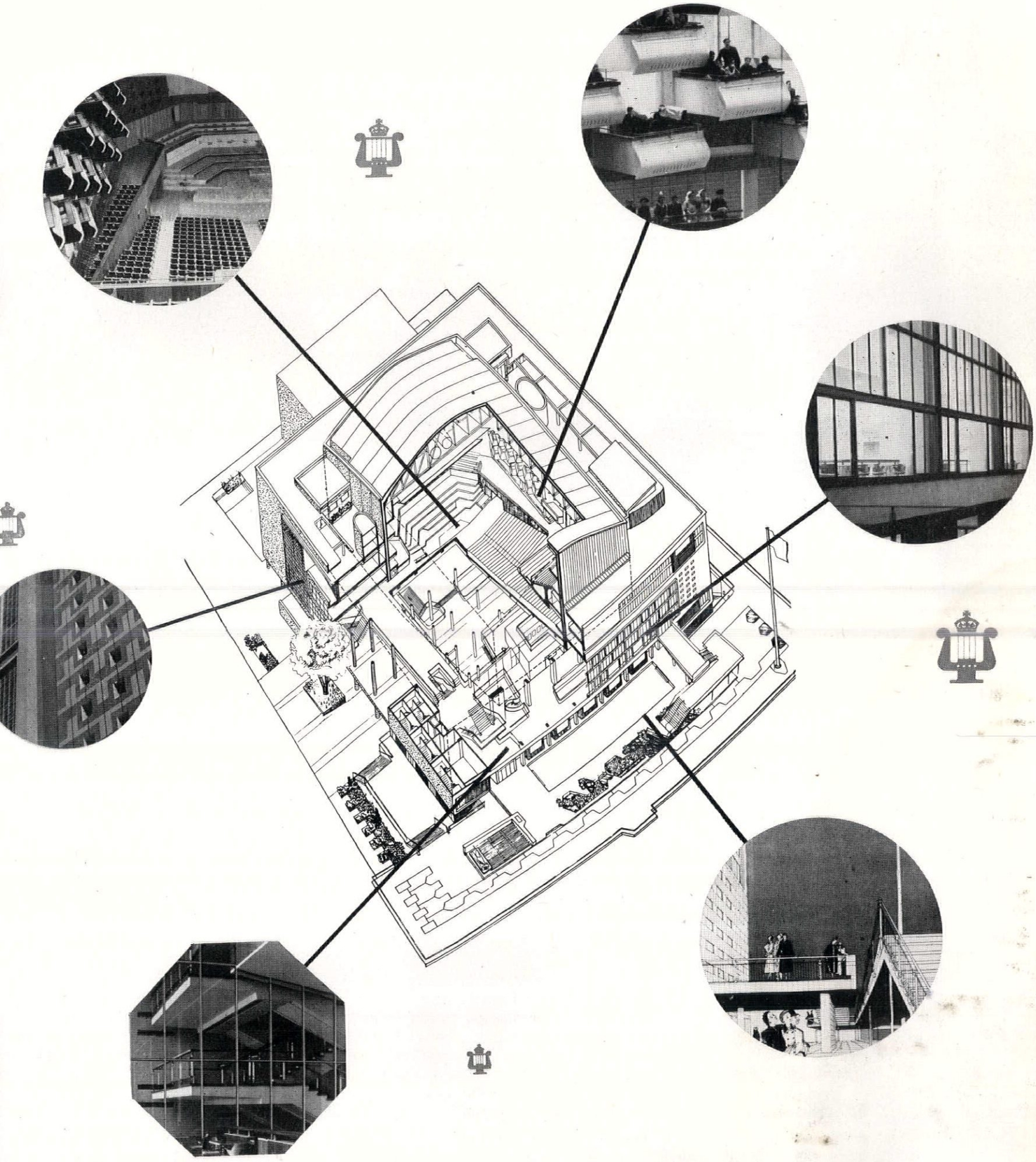
The architects of the Royal Festival Hall tried to do two things: they tried to produce a *floating and airy* structure, which one critic described as a "solid egg (hanging) in a transparent box," and they also tried to produce a *monumental* structure which the same critic described as having a "fixed and permanent form."

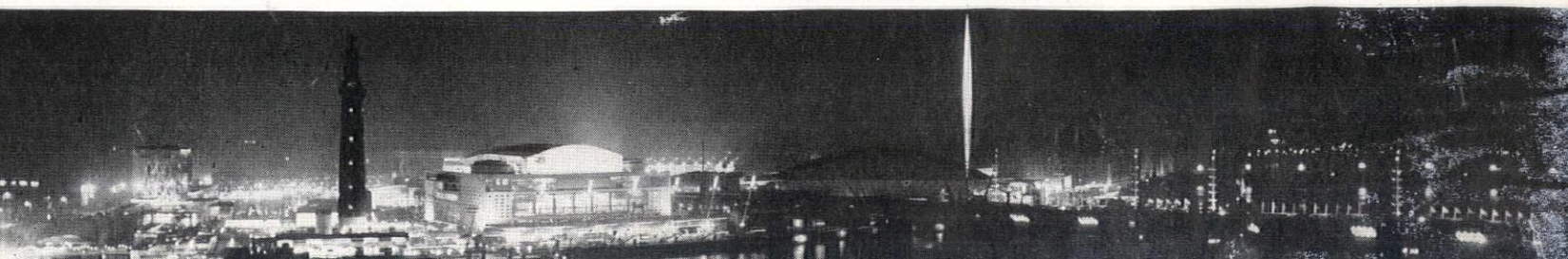
In spite of the impressive detailing and superb finishes, these two conflicting aims seem to have proved too hard to reconcile. The concept of a solid egg (the auditorium) floating in a light and transparent cage (containing foyers, restaurants, bars, etc.) might have produced a spidery structure not unlike a Zeppelin turned inside out; while a strangely traditional concept of monumentality seems to have suggested a heavy structure.

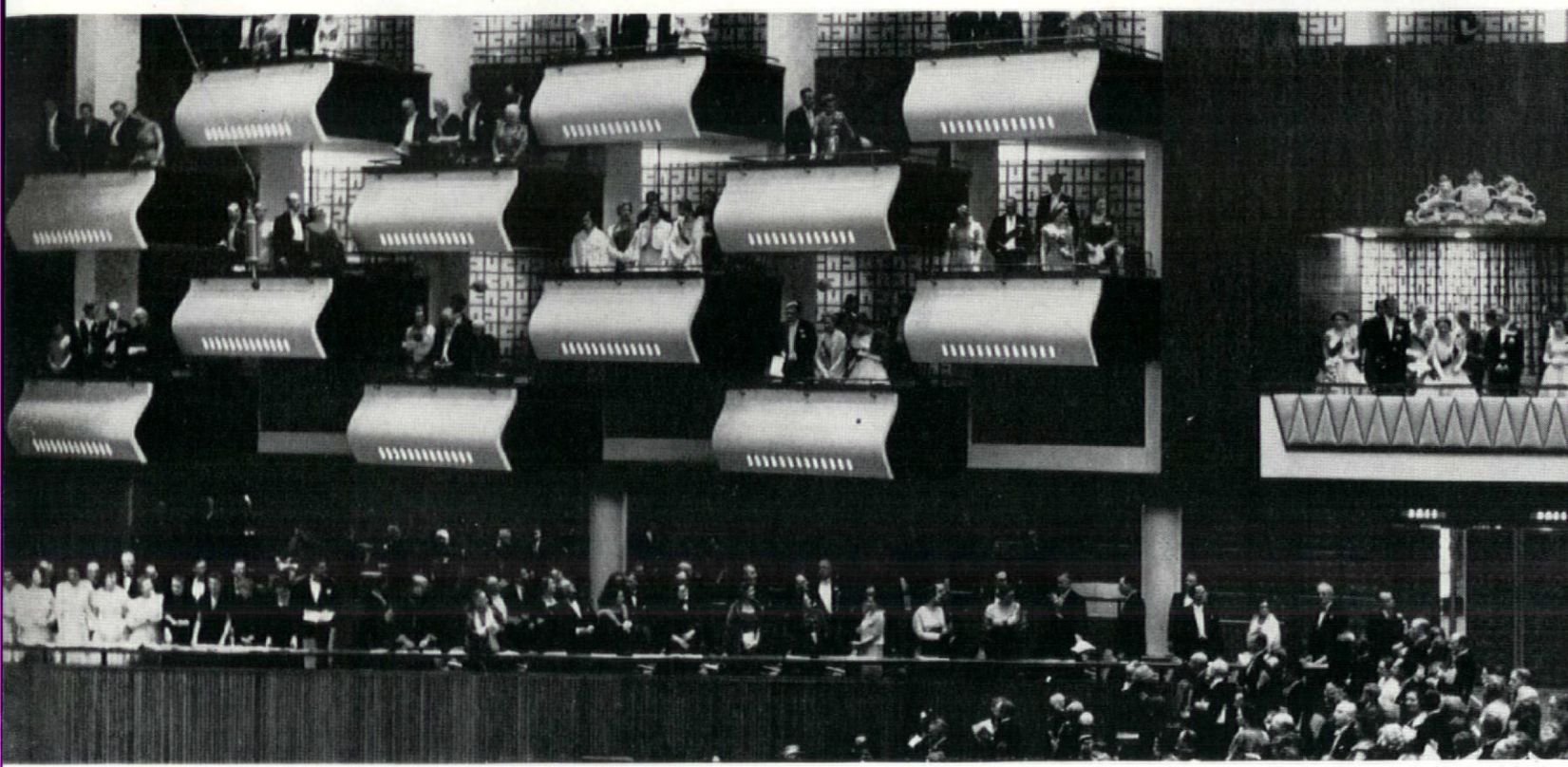
Somehow the Royal Festival Hall achieved neither of these extremes. It may be argued that its *semi*-airiness combined with a *semi*-solidity represents a new concept of monumentality, but the finished product does not appear too self-assured in any such new direction. Perhaps the moral is that small, exquisite detail piled upon small exquisite detail does not necessarily produce a large, exquisite whole but may, instead, end up by obscuring and over-complicating an originally simple idea. (In this respect the Hall is curiously like the magnificent English cathedrals with all their elaborate Gothic detail. But in the great cathedrals the simple and noble idea was never lost, and the elaborate detail served merely to reinforce the overall concept.)

Another lesson of the Royal Festival Hall may be that modern architecture must find its own way to express monumentality and cannot successfully fall back upon mass, weight and other traditional notions intended to suggest permanence.

The Royal Festival Hall does represent a milestone in two important respects. It is quite possibly the best-finished modern building anywhere in the world. Its standard of detailing and its excellence of workmanship are a challenge to every modern architect practicing today. More importantly, the Royal Festival Hall is a milestone in public acceptance of modern architecture: When the government of the largest city in the world calls upon some of its most advanced architects to build the most important public building in several decades, the occasion is something to cheer about. And when that city government is rewarded with a building that functions so well, that is so flawlessly planned, that is so beautifully built and so meticulously detailed, the occasion is also evidence that modern architecture has come of age.







Photos: Courtesy Architectural Review

ACOUSTICS IN THE ROYAL FESTIVAL HALL

By Prof. Richard H. Bolt

M.I.T. Acoustics Laboratory, one of several Consultants on Acoustics for the Royal Festival Hall

Probably never before has broad cooperation in the solving of acoustics problems been so fully utilized as in the planning of the Royal Festival Hall. Client and user, architect and builder, scientist and musician —each made his contribution. From the first discussions of the proposed building, through sketch studies of basic schemes, during all phases of planning and detailing, field supervision and inspection, acoustics was a determining factor.

Even so careful an approach as this, however, cannot guarantee that every listener will credit the hall with perfect acoustics. Listening to music is an emotional experience. Man has not been completely automatized, and he cannot be expected to exhibit a standardized esthetic judgment. Halls may be praised or condemned for their acoustics, depending on the individual listening, the type of music and on the basis of an endless number of less substantial factors.

Into this apparent confusion the acoustical scientist is supposed to bring some degree of predictability. Basically his dilemma is this: science cannot be applied rationally to the engineering of acoustics without a set of standards, and yet the final judges, the audience and musicians, don't seem to subscribe to any such set. In spite of this the answer must somehow be found in those judges. If they will not all respond alike, one can at least look for an average response.

Polls and surveys

Several years before the Festival Hall plans were drawn, the acoustics group of the Building Research Station, in collaboration with colleagues at home and abroad, embarked on a program of subjective interrogation of music listeners. In a number of concert halls people of different backgrounds and tastes assisted in these tests. From many positions in

each hall they listened to a wide variety of music, recording their impressions in carefully prepared questionnaires.

In a general way, the answers confirmed previously employed criteria dealing with (a) low background noise, (b) optimum reverberation characteristics, (c) adequate loudness, and (d) proper distribution of sound, without echoes, focusing and similar faults.

Intruding noises

All evidence indicated that intruding noise must be reduced to a very low value if it is to cause negligible disturbance to concert goers. An average background noise level of 30 to 35 decibels has long been recommended as the upper limit, but there has been some tendency to believe that this standard was too high. Few concert halls today meet this specification. Indeed, in the heart of a city it is very difficult to achieve this standard because of traffic noises.

The Festival Hall is in the heart of a city with heavy traffic on the ground and in the air. An added complication is that the Hall is near one end of Hungerford Bridge, a steel structure that carries a dense traffic of electric trains across the Thames. The vibration and noise from this railroad reaches very large amplitudes over a wide range of frequencies, extending down to the very low frequencies that are difficult to control in building structures. A first step, proposed by the acoustics advisers, was to lay new tracks over the bridge. It turned out that smoother rails reduced the amount of vibration very considerably.

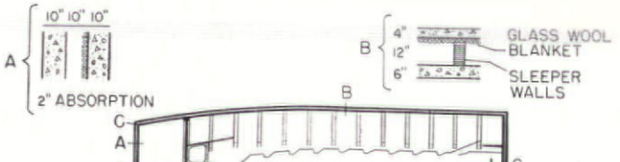


Fig. 1: Section through auditorium

Noise control

The most important feature of noise control for this hall is the complete double shell arrangement shown in the sketch above. The inner and outer shells of the hall are substantially independent concrete structures separated by an air space of 10″ or more. The number of structural connections between these shells was reduced to a minimum and at all such points the load-bearing surfaces are separated by asbestos felt pads. The inner box is perforated only for entry doors. The ventilation system is contained within this inner shell, and there are no exterior windows. *Special double swinging doors (see Figure 2) were designed to provide a reasonable degree of insulation.* The edges of the doors and jambs are fitted with an absorbent treatment of mineral wool behind a perforated facing.

Noise from outside must pass through a tortuous path before it can reach the interior of the concert hall. Surrounding rooms form part of the armor. The floor of the hall is several levels above exterior grade. *The entire double-shell box is mounted on columns which are separated from mass concrete foundations by compliant asbestos pads.*

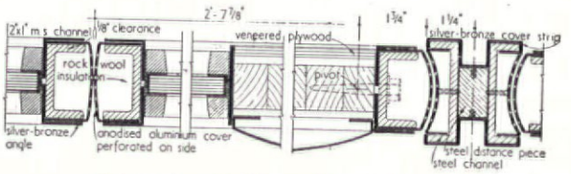


Fig. 2: Acoustically treated swinging doors

The final plans include a small hall which has not been built as yet. This hall will lie at a level below the main auditorium and slightly offset from the stage end. A foyer directly under the main orchestral platform will serve both the small and large halls. If these two halls are to be used simultaneously, there must be a very high degree of noise reduction between them to insulate the sounds of a full orchestra and of the contemplated organ behind the orchestral platform. *One of the principal devices for achieving the required isolation is a concentric column construction shown in Figure 3.* The central column carries the large hall and the surrounding sleeve is to carry the foyer for the small hall. The sleeve and the central column are separated by a wrapping of glass wool blanket and both rest independently on a compliant asbestos pad.

Many of these measures are costly. They are probably the most drastic that have ever been incorporated into the noise shielding of a concert hall. The amount of noise reduction designed into this structure runs up to 70 db in some frequency regions, and in general it is designed to yield a background level below 35 db in both halls under all conceivable conditions of operation. In our opinion, the results will justify every pound sterling put into the building.

Tonal attributes

Another major contribution has been a more searching analysis of tonal attributes of a music room. *The classical concept of concert hall design was that of a rectangular box shape with large areas of wood paneling and usually with a deeply coffered ceiling.* The tone produced in these halls has a full and singing quality, frequently lacking in contemporary halls with an "acoustically contoured" ceiling and fan-shaped plan. To a large extent the fan-shaped plan grows from considerations of sight line and of economy in volume per person. But this design also has been given some backing by acousticians who have adapted it to give reinforcing reflections from the walls and ceiling down to the seating areas. This directing of first reflections can increase the sharpness and definition of the musical tone, and if the path length is not too great it can increase loudness without producing disturbing echoes. A layman's typical response in this type of hall is that the sound is crisp, distinct and loud; but that there is something lacking in fullness and blending of tone.

(Continued on page 226)

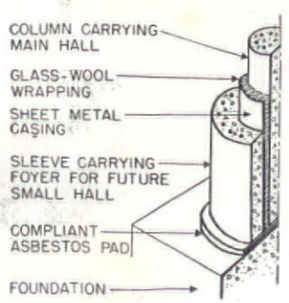
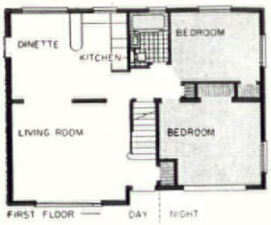
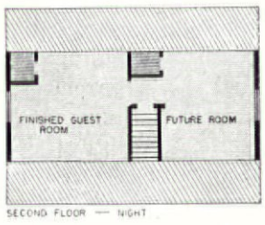


Fig. 3: Concentric columns supporting foyer and auditorium.

RESIDENTIAL AIR CONDITIONING

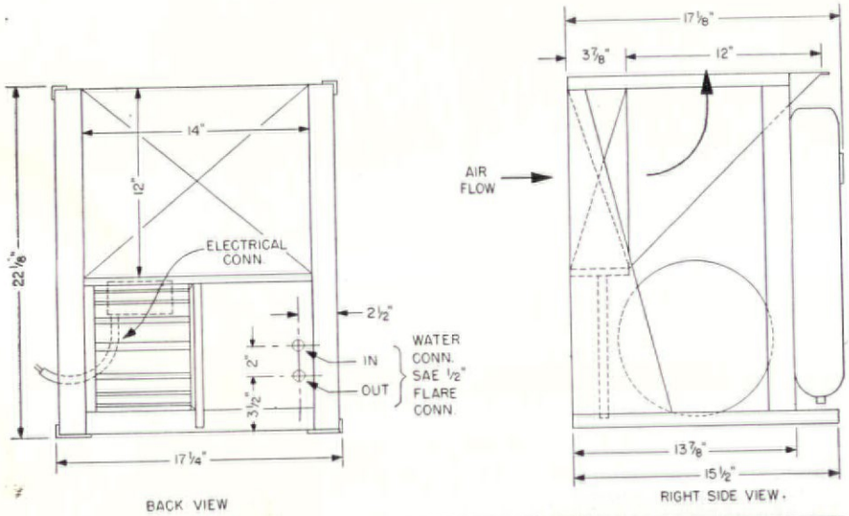
Two installations—one in a low priced builder's house on Long Island and another in twin luxury apartment houses in Philadelphia—point the direction of the next big cooling push

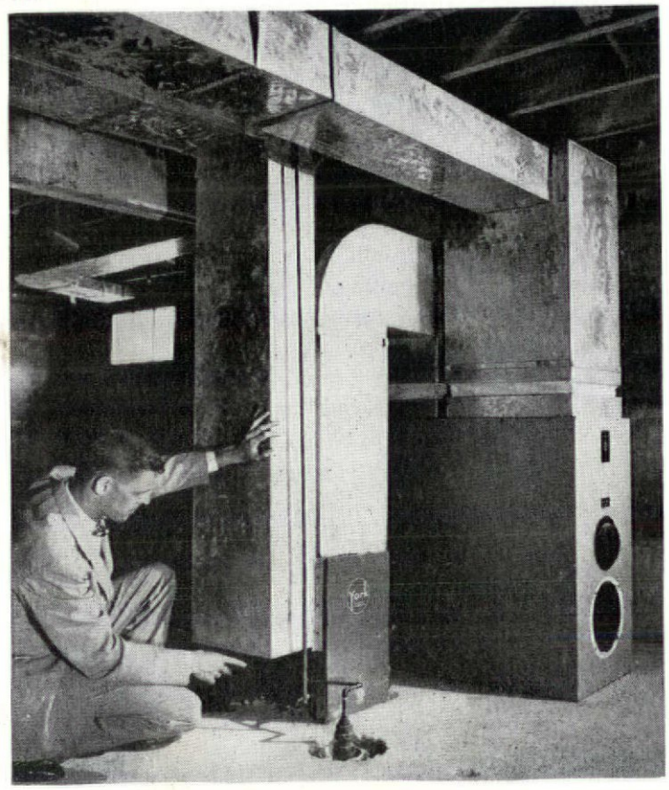




Daytime cooling is zoned informally with full energy of one-ton unit expended on the living and work areas. At night unit is used only for sleeping areas.

Drawings of unit below indicate how small it is. Photo shows installation on Long Island. Unit uses fan in warm air furnace.





The biggest area for expansion of air conditioning is in residential building—apartment houses and detached homes. The big barrier is cost, just as it has been in every new field for air conditioning—from railroad cars to office buildings. But this barrier is not new to the all-conquering air-conditioners; everywhere they go they find an obstacle which at first forbids the considerable expense of summer air cooling. In time this always changes into an economy which demands air conditioning. (Latest conquest: large office buildings—few investors would dare put one up today without mechanical cooling.)

The growing question is: will this ever happen in residential building?

There was evidence this month that big apartment house builders and small housebuilders were worrying the problem. In Philadelphia the two biggest air-conditioned apartment houses so far, a matched pair of 21 and 25 story giants, were nearly completed. A short distance away, on the builders' plains of central Long Island, N. Y., a builder of low priced houses had figured out an ingenious method for putting effective air conditioning equipment into a $13,000 house for under $600. It was apparent that when all of the air conditioning industry gets interested enough in residential cooling, big things will happen. This might not even require the whole industry, but only a few builders.

Informal zoning in a builder's house

Builder Harold Bell is installing only a one-ton air-conditioner in his houses in Freeport, Long Island, but this one ton is designed to be effective over the whole house—one section at a time. The key to this smart idea is an informal kind of zoning operation within the house, by which only the rooms in heaviest use at any one time are cooled.

The air conditioning unit is located centrally, utilizing the ducts of the winter warm air heating system. But there are cut-offs on the duct grilles which in summer will allow the total cooling capacity of the air-conditioner to be concentrated on a part of the house, excluding other parts. The occupant can have a ton of air conditioning at work in the kitchen and living-dining room when those rooms are in use, then later in the evening cut off that area and open up the bedroom grilles, for cooled sleeping.

This of course will not do a hundred per cent air conditioning job on the house, but the percentage cost is way below the percentage of efficiency of the scheme. The York Corp. will sell builders this ton of air conditioning for $325 f.o.b. (with enclosing panels to earn Underwriters Approval, $349). Installation costs, including plumbing and electrical connections and duct fittings, raise the total cost to between $500 and $600. The house sells for $13,250. The unit uses one to 1½ gallons of water per minute; there is no recirculation. Electrical consumption is .82 kilowatts per hour. Total operating costs in Freeport for 30 days running the unit 10 hours per day would be $12.68 for water and electricity (total consumption 27,000 gallons of water, 246 kilowatts power).

Formal controls in luxury apartments

The Rittenhouse-Claridge and Rittenhouse-Savoy on Philadelphia's swank Rittenhouse Square will not be the first apartment houses to have cool rooms in summer. Many big city apartment houses have facades already studded with warty but efficient protuberances representing unit, or "room," conditioners. (A total of 290,000 of these have been made and sold this year.) But the Rittenhouse twins will be the first apartment houses of their size to be cooled as complete buildings, from central water chilling equipment installed and maintained by the building owner.

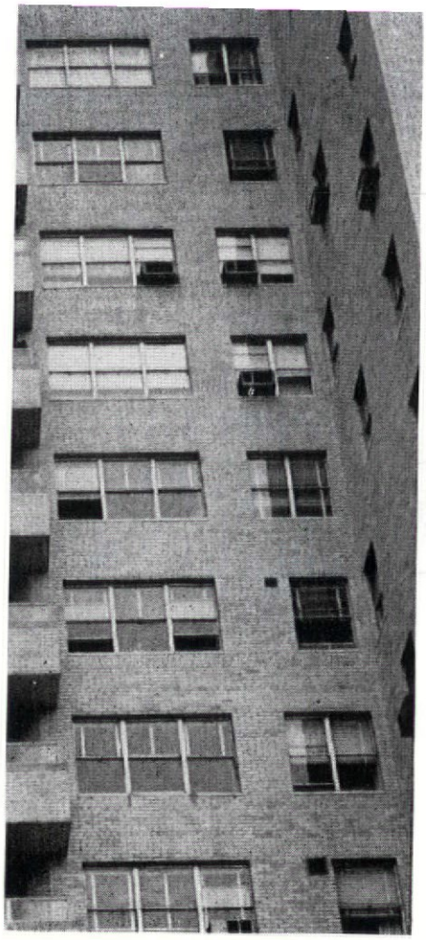
The system, manufactured by York Corp., is not induction air conditioning. It does not circulate cooled air through ducts from a central source. Instead it uses chilled water circulated through 2″ steel pipes to fan units in the exterior walls of the apartments. Each of these units has an individual outside air intake penetrating the spandrel wall; and a dampering arrangement is incorporated in each by means of which the apartment occupant may vary the amount of outside air introduced, from the minimum required for ventilation up to 100%, without affecting the operation of the air conditioning in any other apartment. Most of the cooling will ordinarily be done with recirculated air. All air handled by the units, both recirculated and outside air, is filtered before it is sent through the living quarters. This air conditioning layout saves considerable space over a duct system, since it eliminates fan rooms and air-handling equipment.

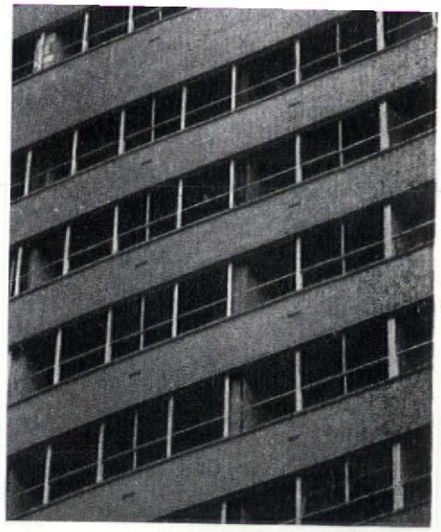
Total cooling capacity of the two apartments' systems is 1,100 tons. A cooling tower on each building will keep the consumption of city water down to about 50 gallons of water per minute. Municipal steam is used winter and summer in the central plants. Zone control anticipates the general needs of the units in various parts of the building —although a simple proportioning damper and fan speed controls permit each apartment's occupant to make further adjustment. The water distributed to all units in each zone is supplied by a recirculation pump in conjunction with a three-way mixing valve controlled by a thermostat in the supply water line. This thermostat is reset by outdoor thermostats sensing outside temperatures and sun effect on the different walls. Summer circulating water temperature goes as low as 45° F.; winter high is about 165° F. Only three 2″ pipes are needed in the system—supply, return, and condensate lines. An electrical connection for the two fans in each wall unit completes the setup.

How much does cooling an apartment house cost, and what is it worth in rent? Neither question has a bare answer today. Total cost of the new Rittenhouse apartments is estimated at $10 million, including land. Of this, between $650,000 and $700,000 goes for cooling and heating—with more than half for cooling.

The average Rittenhouse apartment will be small, 1.8 rooms; the figure quoted for its cooling cost in equipment is $450; heating adds another $300. This hypothetical average apartment will cost the building owner $6 to $8

(Continued on page 242)

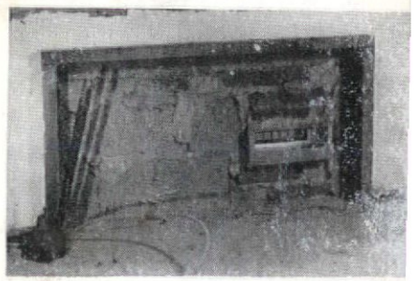


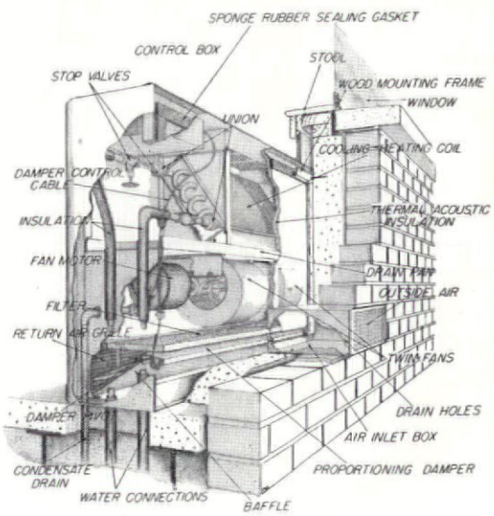


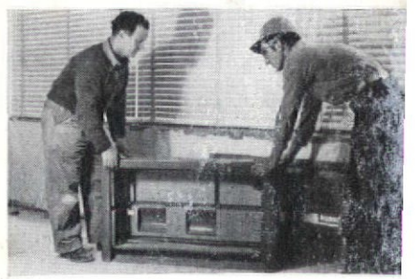
Typical new luxury apartment, left, shows the high proportion of tenants who put in air conditioning individually (note unit air conditioners in windows). In Rittenhouse apartments (above) small intake grilles in walls under windows replace unit boxes hung in windows.



Architect for Rittenhouse apartments (right) is Samuel Oshiver. Below is cutaway drawing showing diagrammatically how each wall unit receives cold water in summer from central chilling source, cools air and distributes it in room with two fans. Construction photos (right) are of cavity ready to receive unit, and of unit chassis being placed. Intake grille can be anywhere in wall behind unit.







HUNG FIREPROOFING

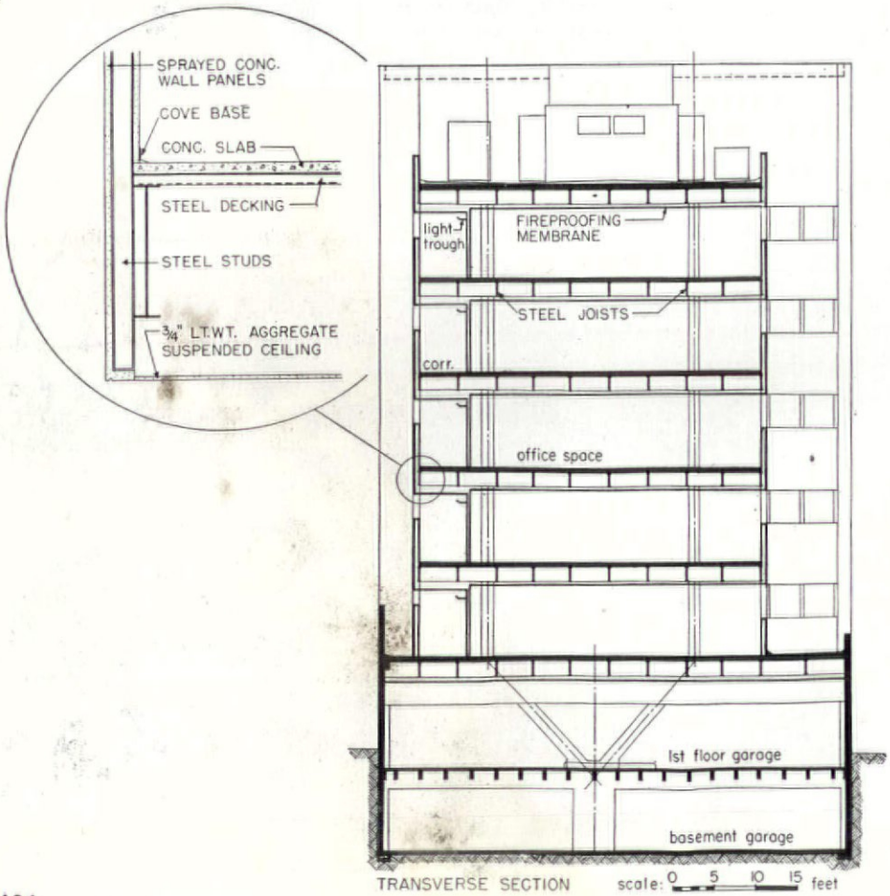
Building codes are beginning to allow some of the masonry fireproofing to be peeled off designs for new steel frame structures and replaced with lightweight aggregate membranes





Photographs of Sinclair Oil Building in construction show how simple it is to fireproof steel beams with a hung ceiling instead of upholstering them individually.

Section below is Mid Wilshire Medical Building. With the single membrane fireproofing ceiling, Los Angeles building code decreed that duct openings into the ceiling space be limited to 85 sq. in. each 100 sq. ft. of ceiling area; each duct opening, whether directly in the ceiling or in the form of side wall grilles, had to be provided with a fusible link fire damper; where it was necessary to gain access to items such as air conditioning equipment in the ceiling space, underwriter-labeled fire doors were required; the top surface of ducts could not be closer than 2″ from the floor units and the bottom surface not closer than 3½″ from the metal lath of the ceiling; electrical outlets penetrating the ceiling were limited to one in each 90 sq. ft. of ceiling area.



Code changes in cities on both sides of the U. S. were last month finally permitting builders to leave out some of the ponderous masonry fireproofing on steel frame structures. Two new business structures, one in Los Angeles, one in New York City, were approved and going up without the old 2″ fireproofing upholstery of heavy concrete on steel beams and joists . . . instead, the New York and Los Angeles Building Commissions had accepted the fireproofing efficiency of ceilings made from lightweight aggregate plaster, hung below the beams and joists with the steel members and floor decking left naked.

In New York

The east coast structure was the big new addition to the periphery of Rockefeller Center, Architects Carson & Lundin's 26 story Sinclair Oil Building (which will be the highest rent office space in N. Y. at $8 per sq. ft.). The exterior faces of the spandrel beams in this nearly completed building have the usual concrete insulation, but the horizontal steel which supports the cellular steel floor decking inside the shell of the building is covered only with paint, not plastered with concrete. The upper fire boundary for this steel is the floor it supports. The lower fire boundary is a 1″ thick ceiling of lightweight perlite plaster on expanded metal lath, suspended from the steel decking on 1 x 3/16″ hangers at 4′ intervals. Double suspended ceilings are used in core areas, to hide utilities, with 2″ perlite gypsum plaster fire stops around the perimeter.

Savings in money and time by this membrane fireproofing technique are twofold:

- It is faster (and about half as expensive) to apply fireproofing to a flat surface like the ceiling, than to plaster the three exposed surfaces of the beams and joists, plus intervening areas.

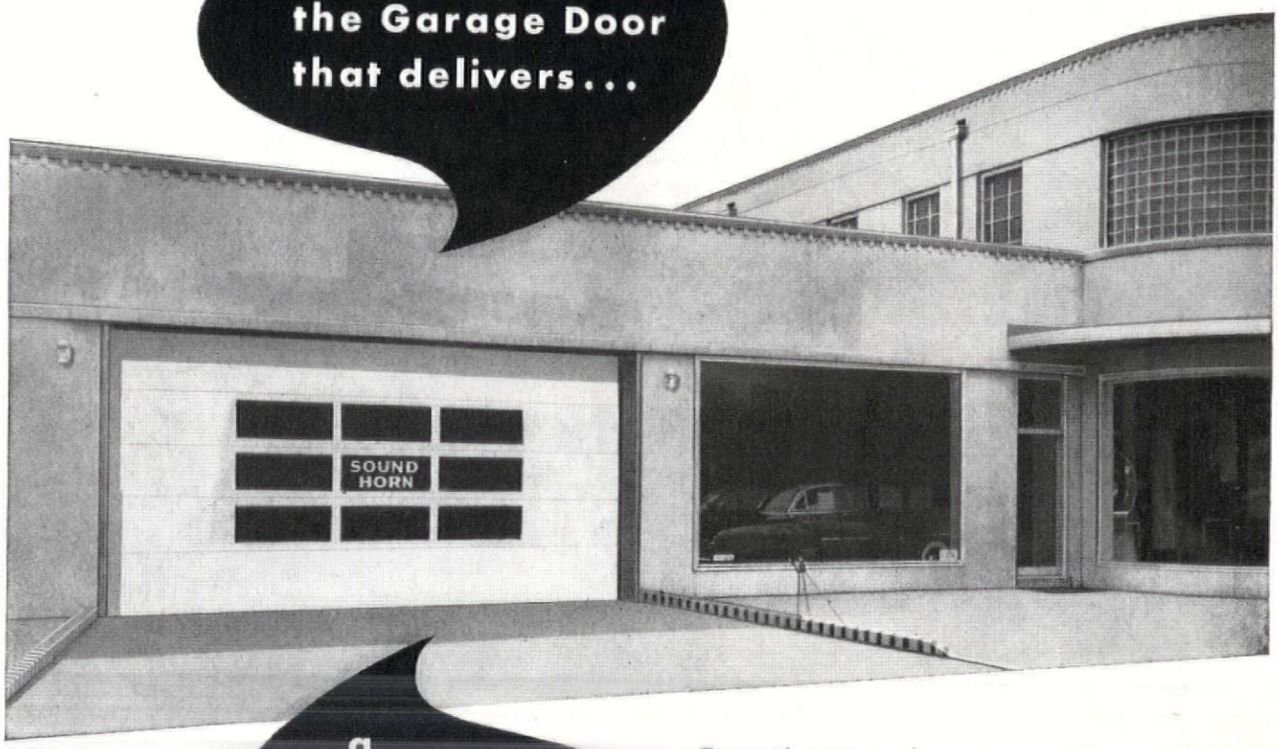
- Using the light fireproof plaster saves so much weight that the dead load of the building is substantially reduced and smaller steel sizes can be specified. A dead weight saving of 200 lb. per lin. ft.—10% of the carrying capacity of an 18″ beam on a 25′ span—can be made with use of perlite plaster fireproofing. (Steel costs 15 cents per lb. erected in the New York area on a big job today, so the savings can be substantial.)

In Los Angeles

Architects Gruen & Krummecks' Mid Wilshire Medical Building uses a single hung ceiling of ¾″ of vermiculite plaster to fireproof the horizontal steel, and also fireproofs vertical structural members by boxing them in with a thin lightweight shell instead of plastering them. Because Gruen & Krummeck used only a single membrane, with ducts and other mechanical services above the fireproofing ceiling, the Los Angeles Building Department imposed several further requirements (see caption, left).

Fire dampers required for the penetration of the ceiling membrane cost the builders $4 each, totaling about $1,700 for the building. But total cost and erection speed was still far below conventional construction: an estimated 10 to 12% cheaper and 60 days faster than a complete concrete structural frame, and 15% cheaper and 35 days faster than a steel frame structure with the main girders fireproofed with concrete.

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a 7-POINT BONUS ...without extra cost

Count the extra values—*at no extra cost*—and you know why Ro-Way Overhead Type Doors are first choice of so many leading architects, builders and owners:

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All seven at no extra cost when you specify RO-WAY OVERHEAD TYPE DOORS for all industrial, commercial and residential jobs.

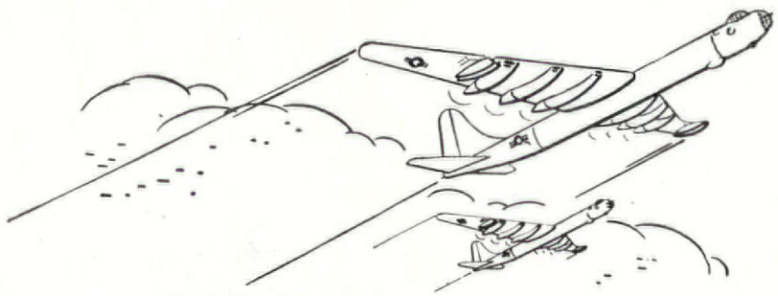
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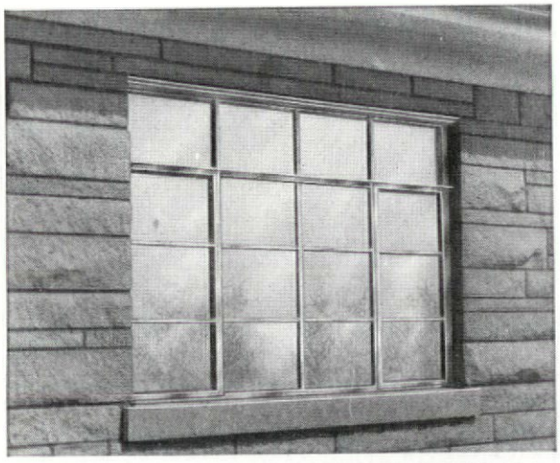


THE SKY IS NO LIMIT TO THE USES OF ALUMINUM

From thinnest foil to jet-plane armor, aluminum is the most versatile of metals. It has become the architect's most modern material. No other metal within economic reach can be rolled so fine, extruded so easily in endless shapes, drawn, forged, cast. No other metal offers *at low cost* aluminum's freedom from rust and resistance to corrosion. No other metal combines light weight with a strength which can be made equal to mild steel. And no other low-cost metal can equal aluminum's radiant heat reflectivity.

From this extraordinary range of characteristics stems the scope of aluminum's uses. Aluminum roofing, siding, gutters and downspouts, insulation and vapor barrier, windows, screens...these have become staple building materials. Decoratively as well as functionally, the field broadens...aluminum spandrels, bas-reliefs, spires, railings, doors, moldings. And there is an increasing trend to aluminum structurals.

Reynolds, leader in aluminum building products, offers literature on technical engineering subjects such as "Aluminum Extrusions," "Aluminum Structurals," as well as on the specific products shown. Address inquiries to **Reynolds Metals Company,** Building Products Division, 2019 South Ninth St., Louisville 1, Ky.



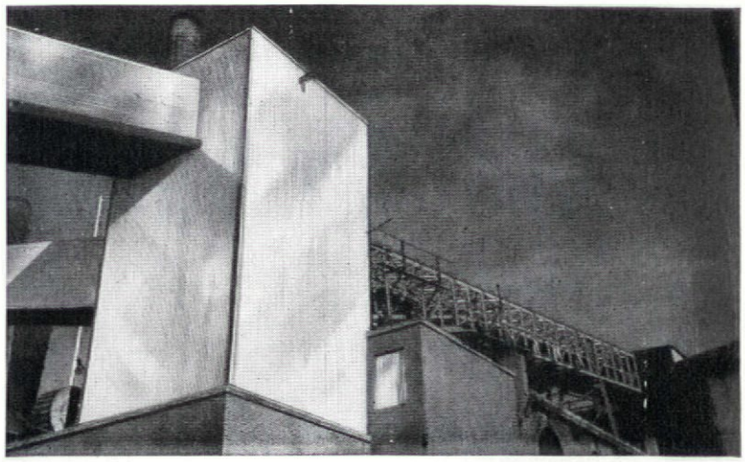
REYNOLDS ALUMINUM WINDOWS

Reynolds Residential Casement, Double-Hung, Fixed and Picture Windows have won an outstanding reputation for superfinish, for strength of corners and consequent weathertightness, for beauty of design. Military demands for aluminum affect production, but capacity is expanding. Check your supplier.

REYNOLDS

REYNOLDS *Lifetime* ALUMINUM INDUSTRIAL CORRUGATED

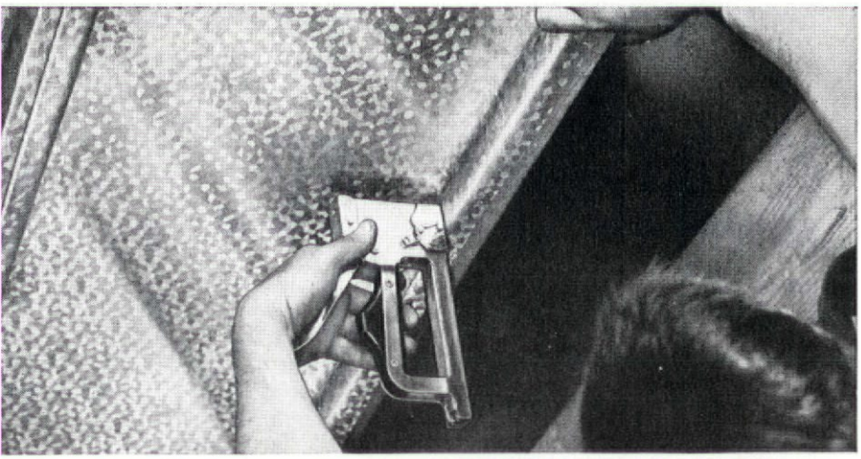
As used on the 600-foot coal conveyor system of the Worcester County Electric Company, New England Electric System. .032" thick, with extra deep corrugations (⅞" deep by 2⅔" crown to crown), this corrugated weighs only 56 lbs. per square, yet supports 80 p.s.f. uniform roof load over 4' purlin spacing. This light weight combined with strength makes possible important economies in framing. For low applied cost and *lowest* maintenance, specify Reynolds *Lifetime* Aluminum Industrial Corrugated. DO-rated orders receive priority handling.





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An excellent example of aluminum's *economy*... rustproof gutters at about half the cost of other rustproof materials. Non-staining, too! Reynolds designs include Ogee and Half-Round... 5" residential gutters, with 3" downspouts, either smooth or stippled finish. Also 6" Industrial Half-Round with 4" downspouts. Military needs for aluminum affect production... check your supply source.



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Embossed aluminum foil bonded to one side (Type C) or both sides (Type B) of tough kraft paper... 250 sq. ft. per roll, 25", 33" or 35" wide. A preferred underfloor insulation and vapor barrier over unheated crawl spaces... approximate conductance 0.10 for one layer Type B. Excellent for sidewalls (Type B between studs), and over ceilings or under rafters.



Aluminum is required for planes and other military needs. Expansion is under way, but total supply of aluminum building products is necessarily reduced. Keep checking your supplier for the products shown, and for Reynolds *Lifetime* Aluminum Nails and Flashing.

ALUMINUM

IF YOU SEE RUST YOU KNOW IT'S NOT ALUMINUM

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What a Wonderful New Idea to Work With!



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The name "Blue Ridge *Securit*® Interior Glass Door" is too brand-new to mean much to you—but just wait until you *see* this door.

It's a solid gleaming panel of 3/8"-thick *Patterned Glass*.

It keeps people from seeing in—yet lets in *lots* of light.

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It comes complete with hardware.

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Beauty . . . privacy . . . and light . . . all provided by a door that will lift any room out of the ordinary.

And it's *not* high-priced—you can afford to use it almost anywhere.

Call your Libbey·Owens·Ford Glass Distributor right away. And if you want a detailed folder about the Blue Ridge *Securit* Interior Glass Door, just mail the coupon.

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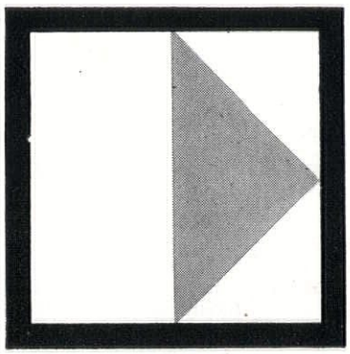
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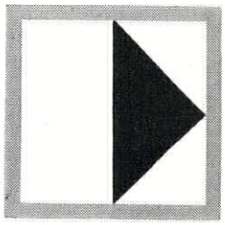
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Eleanor Raymond, *Architect*



A good plan is always better when it includes symbols for telephone outlets.

Every house you design makes some provision for storage, much of it concealed. But unless provision is made for telephones, the wires may have to be exposed. Raceways built into the walls during construction keep wires out of sight, help protect the appearance of thoughtfully designed interiors.

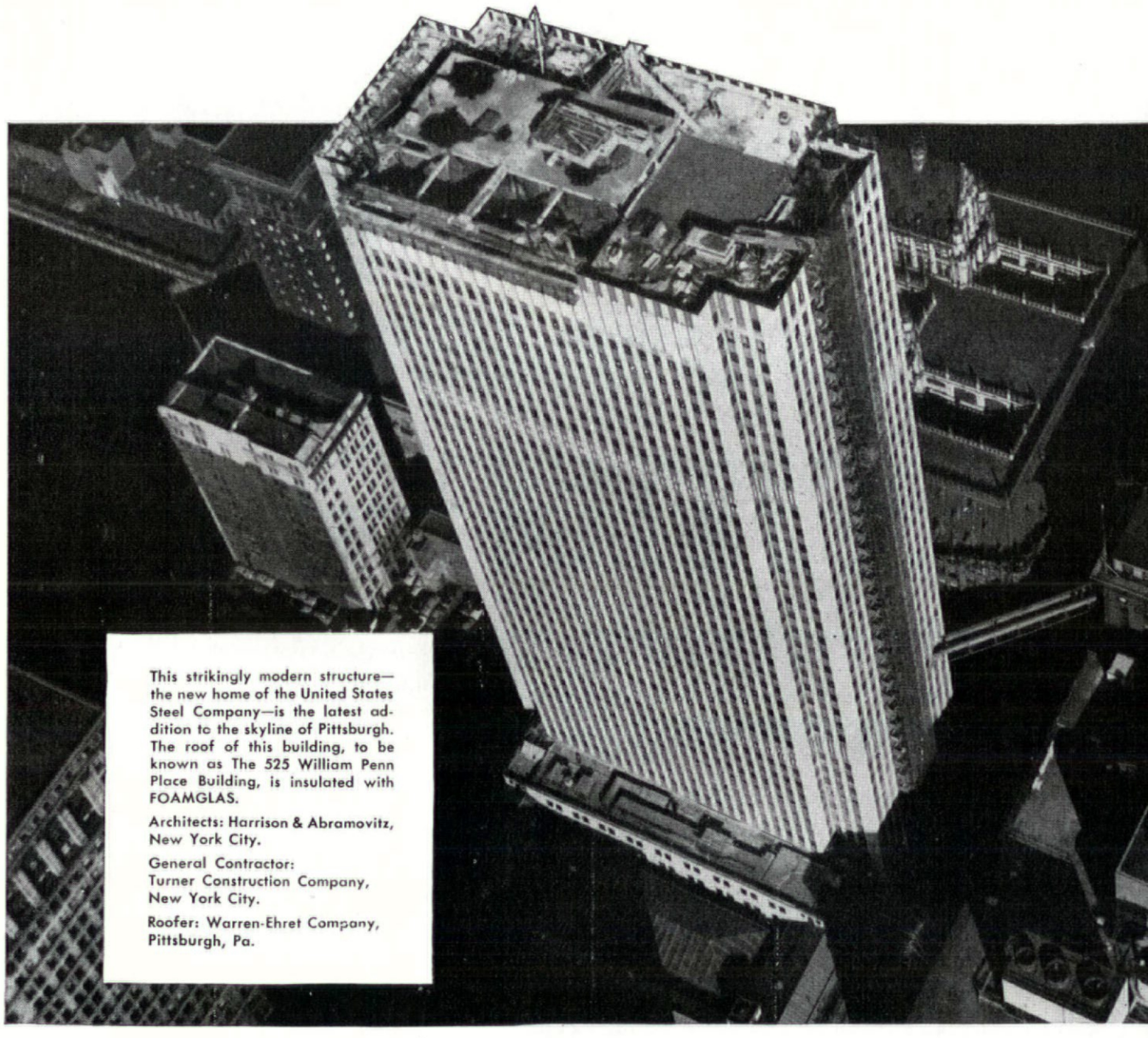
Including telephone raceways in your plans and specifications is always sound planning. Your Bell Telephone Company will be glad to help you lay out economical raceway installations. Just call your nearest Business Office.

BELL TELEPHONE SYSTEM

"Tops" for new

FOAMGLAS

...the long life insulation



This strikingly modern structure—the new home of the United States Steel Company—is the latest addition to the skyline of Pittsburgh. The roof of this building, to be known as The 525 William Penn Place Building, is insulated with FOAMGLAS.

Architects: Harrison & Abramovitz, New York City.

General Contractor: Turner Construction Company, New York City.

Roofer: Warren-Ehret Company, Pittsburgh, Pa.

buildings



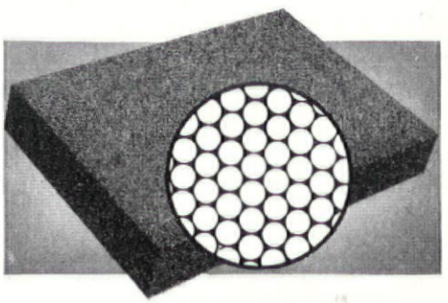
Here you see workmen installing FOAMGLAS on the towering roof of The William Penn Place Building, 42 stories above the street. The big, rigid blocks form a firm, level base for roofing felts, lay up quickly and are easy to handle.

As notable new landmarks accent the skylines of great cities, the preference for this proven insulating material reaches new heights.

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Since FOAMGLAS consists entirely of still air sealed in minute glass cells, it offers more than just excellent insulation qualities—it is also unusually resistant to the many elements which cause ordinary insulation to deteriorate. Therefore, FOAMGLAS is long lasting and trouble free—an effective and economical insulating material, not only for roofs, but also for walls and ceilings, floors and sidewalks.

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PRODUCT NEWS

GLASS INTERIOR DOOR comes ready to hang

This moderately priced glass door lends an unusual decorative touch to a home interior, school or office. Completely equipped and ready-to-install, the door has a translucent pattern which transmits soft light but maintains privacy between rooms. The pattern is the same on both sides and the hardware is placed so that the door may be reversed for either right or left hand openings. Made of a single slab of 3/8" thick heat-tempered glass, the door is said to have three to five times the strength of ordinary glass of the same dimensions. If maximum resistance to thermal shocks or impacts should be exceeded, the door will not splinter but will disintegrate into small crystals. Hinges are bronze finished and have ball-bearings for smooth action. The lock fits into a notched hole in the glass concealed by plastic adapters. (Locks may be fitted for master keys if desired.) Easy to keep clean, the door never requires refinishing. It comes in three standard sizes: 3′ x 7′, 3′ x 6′8″, and 2′8″ x 6′8″, and special sizes are available on order. Eight working drawings showing recommended methods of hanging and lock assembly details are furnished with each door.

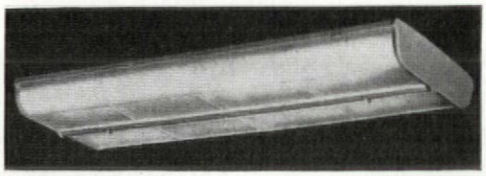


Glass doors come home. Left is Libby-Owens-Ford's new moderate-priced translucent glass door. Complete with ball-bearing hinges.

Manufacturer: Libby-Owens-Ford Glass Co., Toledo, Ohio.

LIGHTING FIXTURES have high illumination level, no glare

Designed for stores, offices and institutional buildings, the Holoflux ceiling luminaires make efficient use of the fluorescent lamps they contain. The general contour and prismatic construction of the glass Controlens are engineered to produce a high light output without causing discomforting glare, even in long continuous runs. Seeing conditions are further improved as the fixtures direct a small amount of light upward to illuminate the ceiling and thereby reduce brightness contrast in the field of view. The new luminaires are neatly styled, and may be



installed individually as well as in extended runs. Their shallowness—only 4½"—simulates semi-recessed construction without the expense of roughing-in, or consequent loss in lighting efficiency. The new models can take either the conventional bipin type lamp or the instant start single pin in 4′ and 8′ lengths. The glass panels may be removed for washing (and immediate restoration of full effectiveness), and a special hinge device permits easy access to the lamps. Prices for the 9300 series range from $63.70 for the model accommodating two 4′ lamps to $161.30 for the four 8′ lamp fixture. All carry Underwriters Laboratories electric fixture labels.

Manufacturer: Holophane Co., Inc., 342 Madison Ave., New York 17, N. Y.

(Continued on page 194)



Architect Harvey P. Clarkson of Petroff and Clarkson, New York, N. Y. specified this suspended Silvray SKYLIKE installation for the conference room jointly used by the Tea Association and the Tea Bureau, Inc. at 500 5th Ave. Providing a medium lighting intensity of approximately 35 foot-candles, these SKYLIKE units represent an initial investment saving of from ⅓ to ¼ the cost of competitive equipment offering comparable results. The lighter weight and internal simplicity of the fixtures also permits additional savings in installation time.

SKYLIKE® Lighting — "installation-proved"

IN SCHOOLS, OFFICES, STORES, AND PUBLIC BUILDINGS

Blending the soft, indirect light of silvered-bowl incandescent lamps with the modern look of fluorescent-type troffers, Silvray SKYLIKE units offer architects wide latitude in planning lighting layouts. As recessed, surface-mounted, or suspended units . . . in patterned groups or panels . . . for new construction or modernization you'll like the versatility, efficiency, and low cost of SKYLIKE fixtures.

Look at these typical installations!

(unretouched photographs, using room light *only*, demonstrate the unusually uniform distribution of light provided by SKYLIKE fixtures).



This high-intensity installation of surface-mounted SKYLIKE units was selected for the modernization of the Amesbury, Massachusetts Public Library. Note the low brightness levels at the light source . . . the 90° shielding . . . the absence of harsh shadows and sharp light cut-off lines.



This patterned group of recessed units in the dining room of the Bader Hotel in Spring Valley, N. Y., illustrates the way Silvray SKYLIKE fixtures fit 24" x 24" ceiling tiles. Note how the soft, even distribution of low intensity light helps to create the desired mood of cheerful hospitality.

Graybar Distributed by Graybar Electric Company

Send for complete SKYLIKE information. A comprehensive booklet describing the SKYLIKE system is yours for the asking. To get your copy, write Graybar Electric Company, Inc., Graybar Building, 420 Lexington Avenue, New York 17, N. Y. S19-138

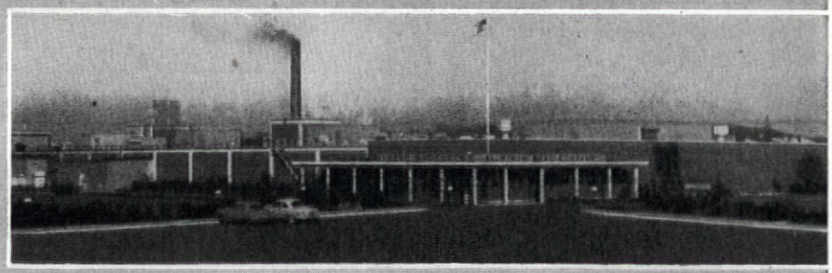
SILVRAY LIGHTING INC.



Aluminum Seal Company, Inc. SUBSIDIARY OF ALUMINUM COMPANY OF AMERICA

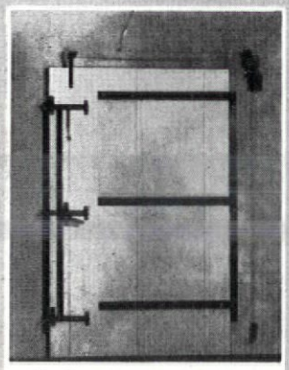
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RICHMOND
Automatic Fire Doors



Aluminum Seal Company Building, Richmond, Ind.
Architects: Giffels & Vallet, Detroit, Mich.

for better fire protection more modern appearance



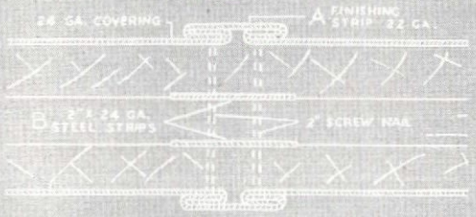
Single-swing Fyrgard Door

The Richmond Fyrgard Door is an outstanding example of how automatic fire doors can be made safer and better through intensive specialization. The Richmond organization is devoted to the improvement, manufacture and installation of fire doors and related products. Such concentration of effort results in surer fire protection, greater manufacturing economies and better architectural design.

Richmond Fyrgard Doors are made in four standard types: Single-slide, Double-slide, Single-swing and Double-swing. Richmond Fyrgard Doors are automatic . . . they close at once when a fire occurs . . . give extra protection from fire, smoke and fumes. Both sides of these doors are covered with 24-gauge galvanized metal which is twice the thickness of the 30-gauge metal used in standard tinclad doors. Many other exclusive patented features add to the protection afforded by Richmond Fire Doors.

Architects who have projects on the boards that require fire doors of any kind, are invited to write in for suggestions. For complete information and specifications of Richmond Fyrgard Doors, write for Service Sheet R5.

Twice thicker steel side sheets mean real fire door protection



RICHMOND Fyrgard door

THE RICHMOND FIREPROOF DOOR COMPANY
RICHMOND, INDIANA
an affiliate of **THE PEELLE COMPANY**

"it's **PEELLE-RICHMOND** *engineered"*

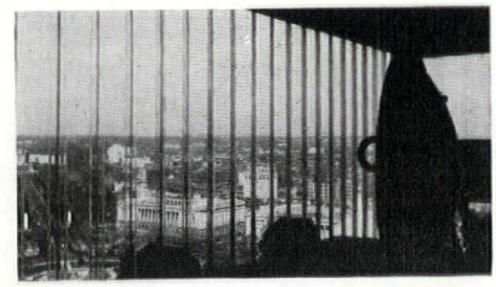
SEE OUR CATALOG IN SWEET'S

AUTOMATIC FIRE DOORS • KALAMEIN DOORS • INDUSTRIAL STEEL DOORS • UNIT STEEL FRAMES

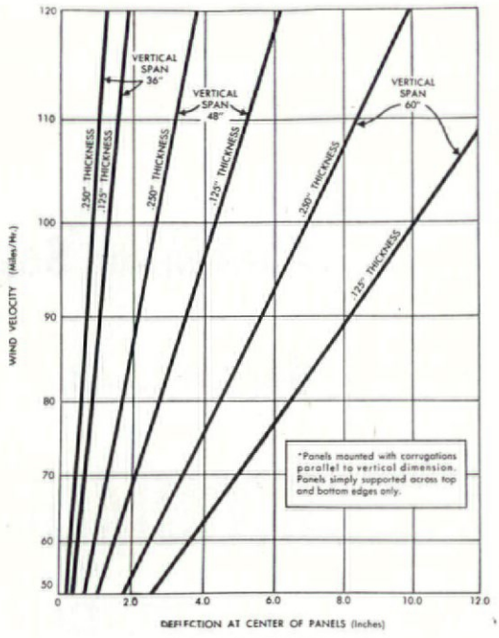
PLASTIC DATA CHARTS evaluate wind deflection of sheet acrylic used as glazing

As availability of plastics has increased since World War II, building applications have kept pace with supply. Weather-resistant acrylics have been used in industrial plants, residential work, and commercial glazing, particularly in high breakage areas. While the use of transparent and translucent acrylics in skylights and windows has been catching on, Rohm & Haas Co., manufacturer of one of the best known sheet plastics, Plexiglas, has intensified its research on its material's behavior under stress and strain. The results of the wind studies conducted by R & H's design and fabrication laboratory are nutshelled into the two charts reproduced on this page. Invaluable aids to the architect, building contractor and safety engineer who prepare specifications for Plexiglas glazing panels, the charts show what thicknesses of flat and corrugated material will withstand wind velocities up to 120 mph. They also indicate what size panels in various thicknesses will deflect within tolerable limits at a known wind velocity, and the degree of deflection which can be expected at higher velocities for each combination of panel size and sheet thickness. Amounts of deflection for corrugated sheet, used vertically and supported only across the top and bottom edges, are plotted on *Chart 1* (above) for material of .125 and .250 thickness in vertical spans of 3, 4 and 5′, under winds of 50 to 120 mph, and for deflections at center of the panels up to 12″. *Chart 2* (below) lists deflections at panel centers for six thicknesses of flat material ranging from .125 to .750, for openings from 30 to 72″, under winds of 50 to 120 mph. To find the deflection in the typical case

(Continued on page 197)



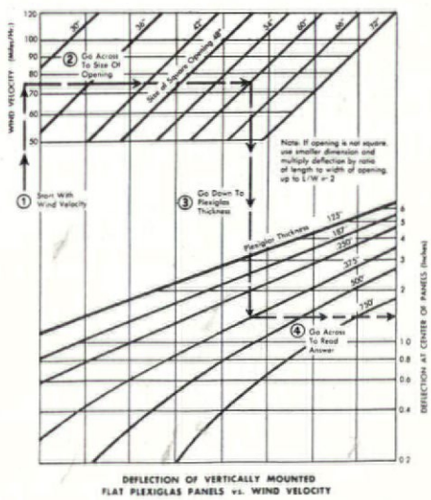
Transparent sheets of V-rib corrugated Plexiglas form an uninterrupted expanse of glazing around this television relay station. The resilient .25″ material, 6′ high, has withstood a 60 mph wind.



DEFLECTION OF VERTICALLY MOUNTED* C-2½ CORRUGATED PLEXIGLAS PANELS vs. WIND VELOCITY

CHART 1.

CHART 2.



DEFLECTION OF VERTICALLY MOUNTED FLAT PLEXIGLAS PANELS vs. WIND VELOCITY

Amtico
RUBBER FLOORING

The makers of famous Amtico Rubber Flooring announce that henceforth American Tile and Rubber Co. will be known as

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RUBBER COMPANY
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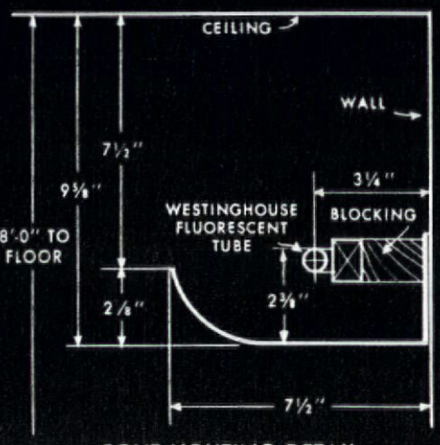
AFFILIATES... BILTRITE RUBBER COMPANY, CHELSEA 50, MASS. • AMERICAN TILE & RUBBER CO., TRENTON 2, N. J. • PANTHER-PANCO RUBBER CO., CHELSEA, MASS. • AMERICAN TILE & RUBBER CO. (CANADA) LTD., SHERBROOKE, QUEBEC • PANTHER RUBBER CO. LTD., SHERBROOKE, QUEBEC, CANADA

ALSO MAKERS OF FAMOUS BILTRITE HEELS AND SOLES

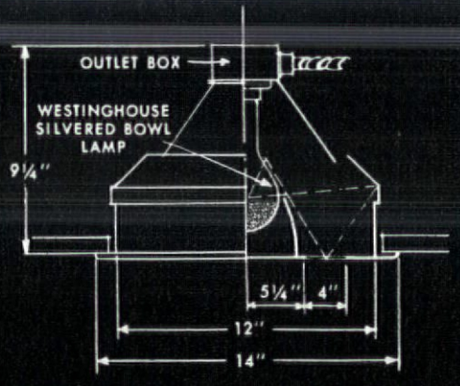
DESIGN DETAILS

PLATE 6 LIGHTING

.. Cove
.. Recessed Ceiling



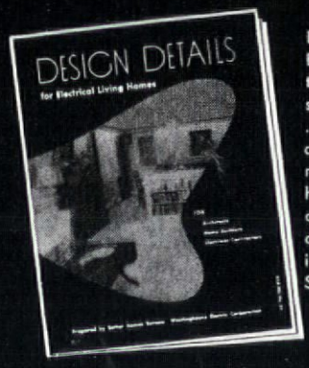
COVE LIGHTING DETAIL



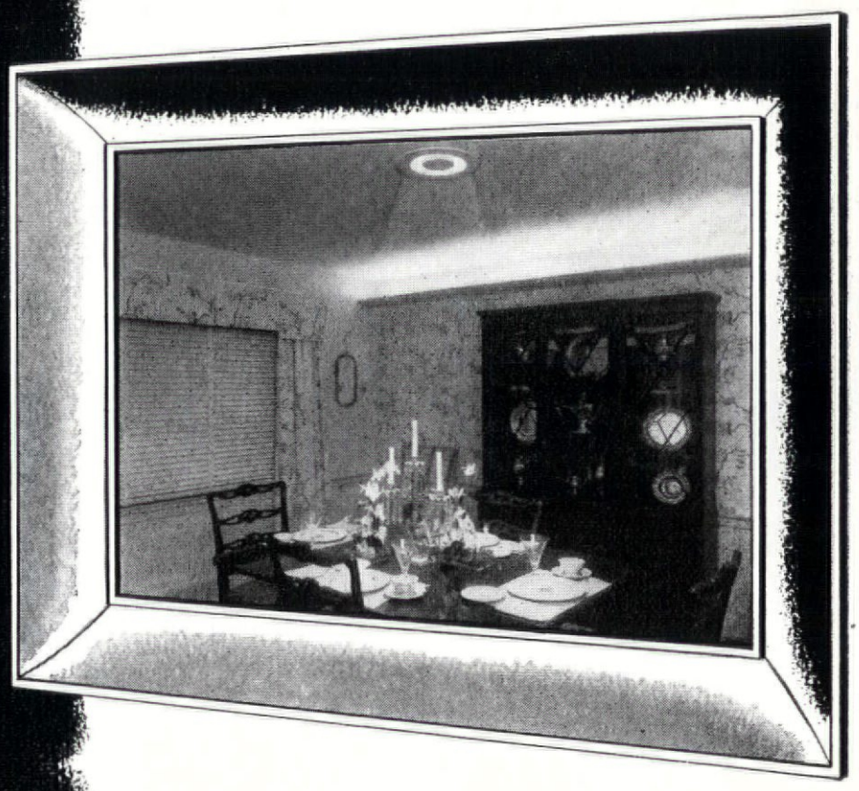
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Lighting is only one of many Electrical Living features that can add value and sales appeal to your homes . . . others include planned all-electric kitchens, automatic laundries, health and heating ideas, and adequate wiring . . . planning details of which are given in this 24-page booklet. Send for your free copy.



Cove and Recessed Lighting ... Give Smartness to a Room

One of the most economical ways to give character to a room is by unusual lighting effects. The room illustrated above is an example. On two walls of the room, an easily constructed cove (see detail) provides good general illumination in addition to its decorative effect.

In the ceiling, centered over the dining table, is a recessed fixture with a silvered bowl, incandescent bulb (see detail). This produces lighting which accents the beauty of the table setting.

There are many other ways in which lighting can give extra sales value to your homes . . . inexpensively. If you would like to have detailed suggestions, send for our booklet "Design Details for Electrical Living Homes". G-10153

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...and for help with the temperature control, we'll talk to Honeywell!

Obviously, cartoonist Crockett Johnson's character, Mr. O'Malley, isn't the most practical architect in the world.

But whatever his shortcomings, he certainly has a mighty practical approach to the problem of temperature control.

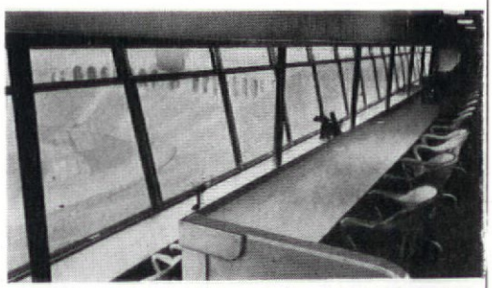
Honeywell *can* help architects and their heating engineers provide the proper thermal environment for any client – anywhere – in any kind of structure. We have a lot of well informed control engineers – in our 91 different offices throughout the country – who are experienced in doing just that. And we have a lot of literature that's yours for the asking – on the automatic control of heating, ventilating and air conditioning.

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For information on how to solve the heating control problem in large buildings, see the column across the page.

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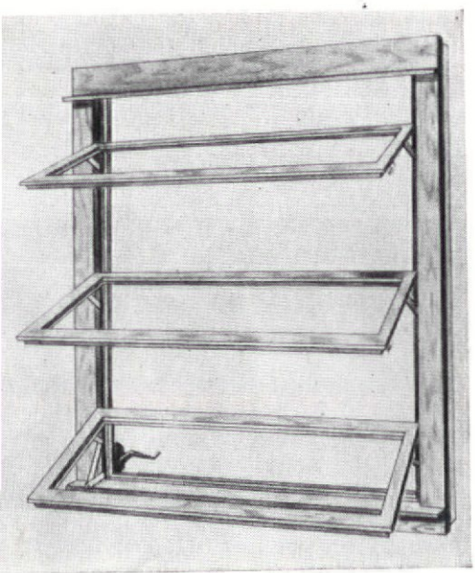
Below, Plexiglas used in a press box

plotted by broken arrow, start at left with wind velocity (in this case 75 mph), go across to size of opening used (60″) and then down to the sheet thickness (.375″). Larger copies of the charts may be obtained at no cost from the manufacturer.

Manufacturer: Rohm & Haas Co., Philadelphia, Pa.

WOOD AWNING WINDOW has concealed hardware, positive weather seal

By adapting the automatic locking principle and other design features of its aluminum awning window in a wood counterpart, Ludman Corp. has produced a popular window type at a modest price. Furthermore, the company feels it can safely assure the window's availability despite metal shortages. Smooth in operation, the crank projects just 2⅝″ inside the sash face. As it is turned part way, the bottom sash opens out first to permit partial ventilation while the upper sash remain closed. Rotated further, the crank will open all the sash until they are almost perpendicular to the frame. All the sash and frame are fir, redwood or ponderosa pine, and are chemically treated against rot, termites and fungi. The sash have a minimum thickness of 1¾″ and are constructed to form a snug double contact with the frame when closed. Should a



slight dimensional change occur in the seasoned wood members the resilient vinyl weatherstripping expands or compresses to keep the entire

(Continued on page 200)

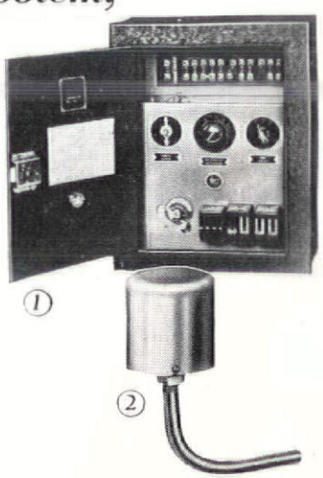
Personalized 8½″ x 9″ reproductions of this Crockett Johnson cartoon are available upon request.



. . . and for help with the temperature control we'll talk to (your firm name)

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Nerve center of Charleston, West Virginia's busy Kanawha Airport, the architectural concrete Terminal Building is acclaimed as one of the handsomest and most efficient structures of its kind. View above shows building from airport apron side. Carved from rugged sandstone hills, runway and service building grading required movement of 9,100,000 cubic yards of rock and dirt. An idea of the size of the operation is given by the fact that on site now occupied by Terminal Building, there once rose a hill 50-feet higher than control tower. Architects for the building: Tucker & Silling, Charleston, West Virginia; Contractor: Kuhn Construction Co., Charleston, West Virginia.

Contractors of Kanawha Airport Terminal Building Report:

"Plywood Cuts Formwork Time and Labor Costs By Over 20 Per Cent"

ECONOMY, SPEED AND APPEARANCE of finished concrete. These constitute the three-way yardstick by which plywood's performance was measured in building the new Kanawha Airport Terminal Building.

Consider speed and economy. According to Charles J. Kuhn, president Kuhn Construction Co., contractors on the airport building, "Plywood speeded formwork operations all along the line . . . cut application time and labor costs by at least 20 per cent."

Consider appearance. Architects Tucker and Silling who specified plywood on the job because "the panels permit a smooth monolithic surface to be cast simultaneously with structure," report that concrete surfaces on the Terminal Building are "uniformly smooth and even-textured."

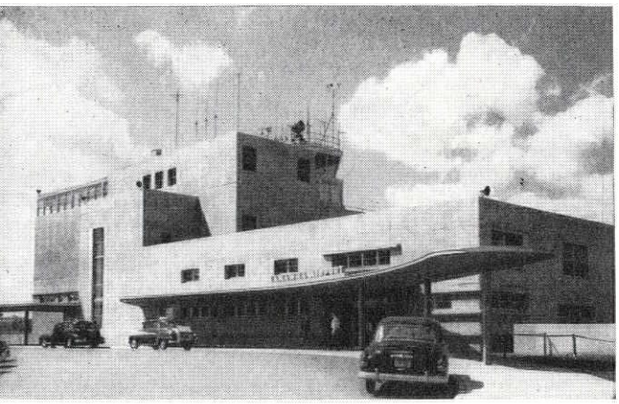
Conclusion? Simply this: Public building or industrial structure . . . apartment or heavy construction project—plywood forms do a *better* job, *faster*, *more economically*.

Douglas Fir

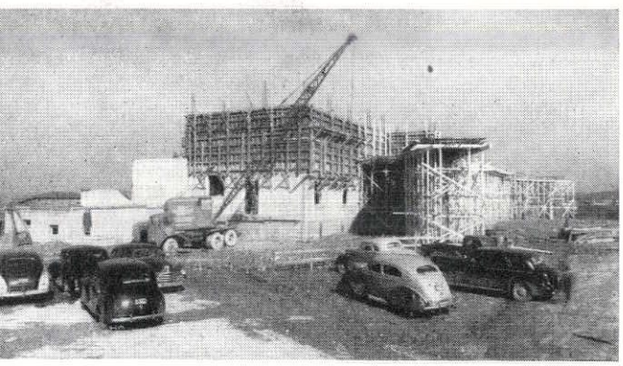
Plywood

AMERICA'

Re-Use of Plywood Form Panels Helps Reduce Construction Costs



Passenger approach side view of Terminal Building shows pleasing functional design obtained by balancing vertical and horizontal masses. In addition to time and labor savings, re-use factor of plywood forms helped reduce construction costs on the job. Re-used to job completion, contractors report, plywood forms were still in good condition after last pour.



Construction view shows plywood forms in place. Form sections were built by placing ¾″-thick Exterior Concrete Form panels across studding. Forms were held in line with double 2″x4″ wales, backed by double 2″x6″ liners, placed vertically. After each use, plywood forms were cleaned, re-oiled and crane-erected into position for next pour. Note scaffolding at right which supports plywood canopy forms.



Large, Light, Strong Real Wood Panels

For additional data on Douglas fir plywood for concrete form work, write (USA only): Douglas Fir Plywood Association, Tacoma 2, Washington. Of particular interest are two booklets: "Concrete Forms of Douglas Fir Plywood" and "Handling PlyForm".

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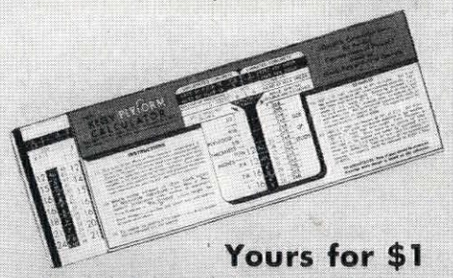
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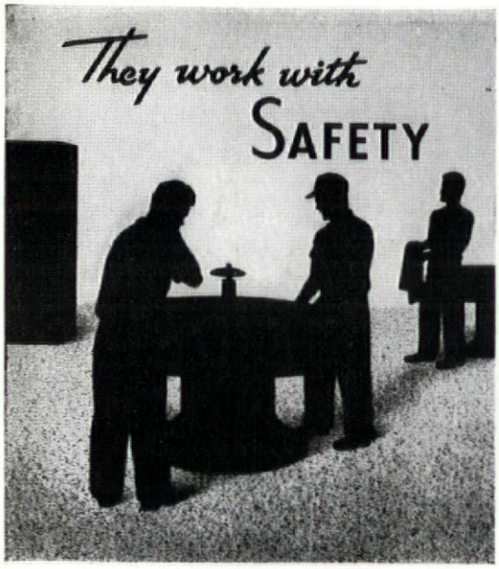
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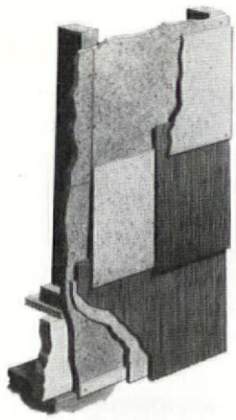
PRODUCT NEWS

perimeter of the window sealed. The working hardware is concealed by a decorative casing which also functions as a receptacle for inside screen and storm sash. It is not necessary however to remove the screen or storm sash while opening or closing the windows. Made in 56 standard sizes, the new Auto-Lok models are selling currently at prices competitive with inexpensive wood windows. The 3′1½″ x 4′5″ size sells for about $29 complete with screen, glass and hardware; the 2′1½″ x 3′5⅝″ unit for $19; and the 4′1½″ x 6′3⅜″ for $42.

Manufacturer: Ludman Corp., Box 4541, Miami, Fla.

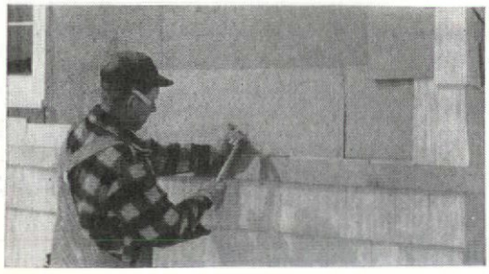
INSULATING SHINGLE BACKER is economical substitute for low grade undercourse shingles

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Manufacturer: Minnesota & Ontario Paper Co., 500 Baker Arcade Bldg., Minneapolis 2, Minn.

(Continued on page 204)



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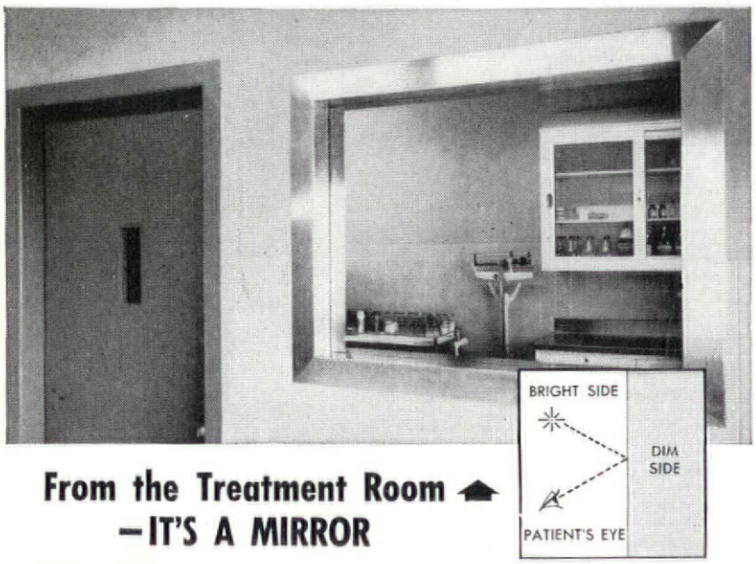
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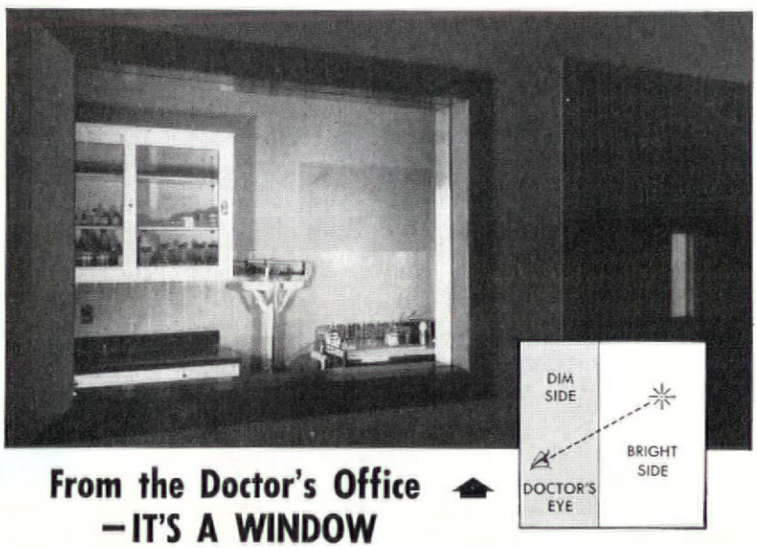
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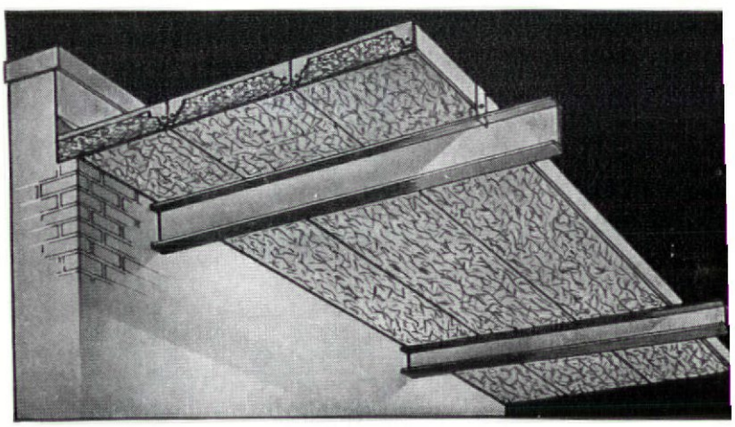
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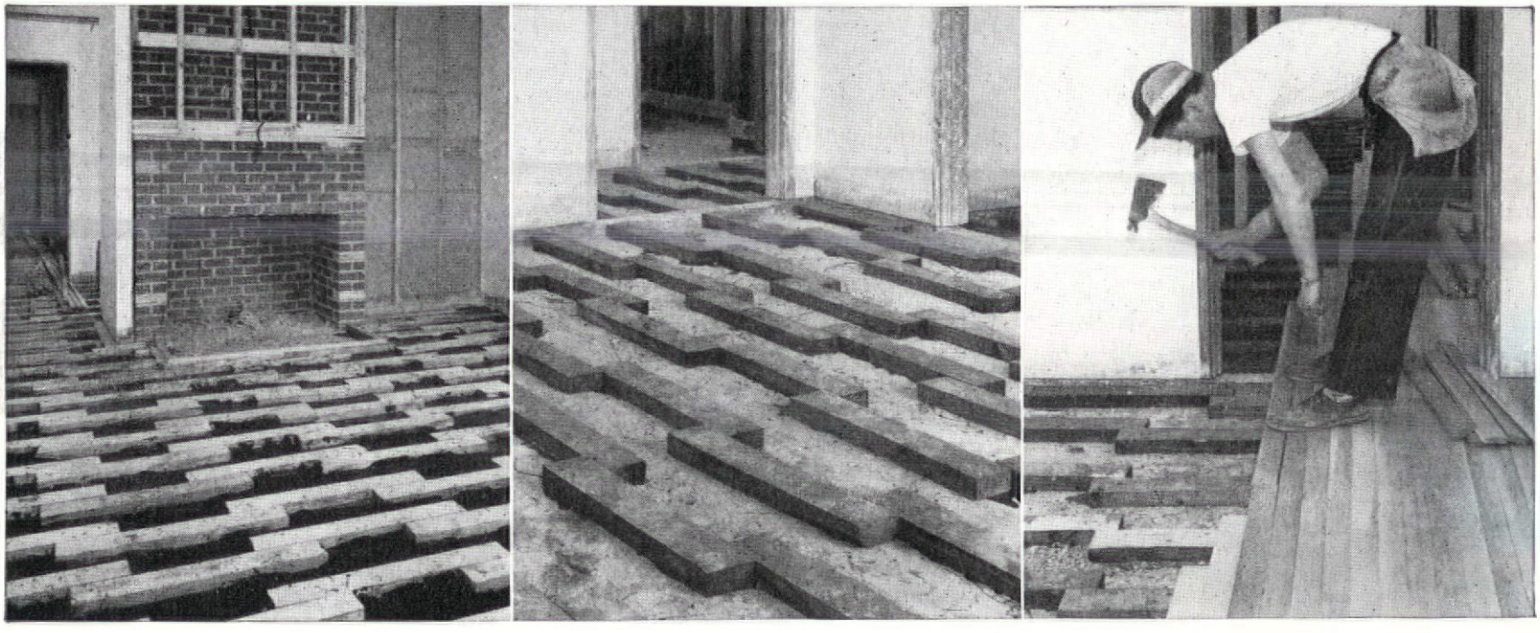
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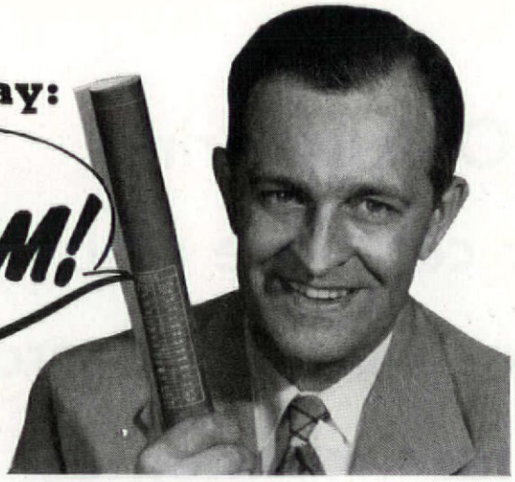
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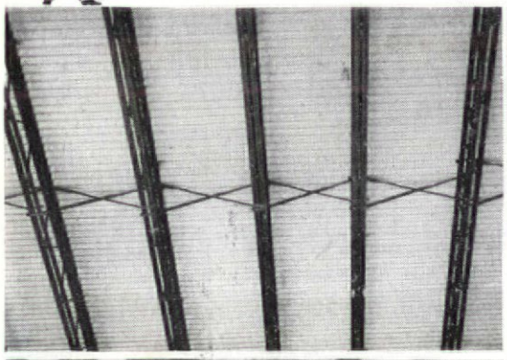
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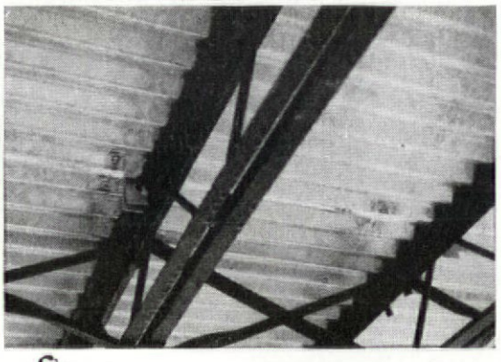


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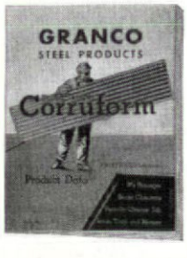
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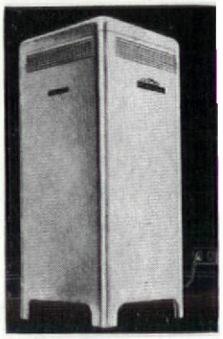
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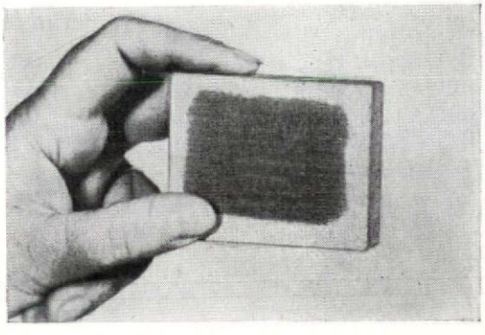
Manufacturer: Mitchell Mfg. Co., 2525 N. Clybourn St., Chicago, Ill.

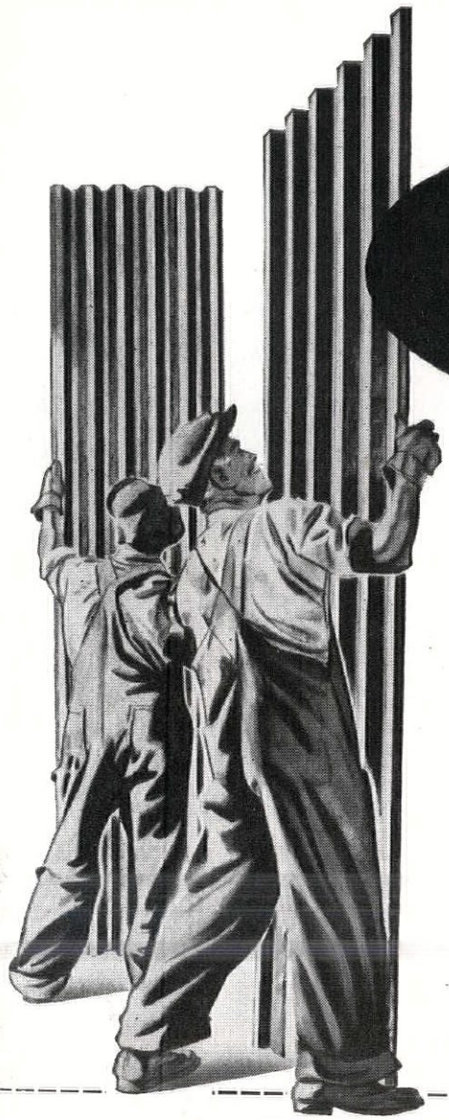
SILICONE COATING for exterior masonry and asbestos shingles repels water

A spray or brush coat of Monoseal is said to penetrate from ¼ to ⅜″ into masonry surfaces to provide good water repellency for about 20 years. Transparent and colorless, the thin liquid does not alter the surface appearance. Because of its silicone content it does not close the masonry pores but coats the pore walls permitting the masonry to breathe. It also prevents unsightly efflorescence and prevents water from carrying stains into the wall material. Dirt and grime stay on the surface where they can be washed off by rain. The manufacturer recommends Monoseal not only for use on brick, concrete, stucco and marble, but also for asbestos shingles. On the photo below, only the outer area of the sandstone was treated with Monoseal before the block was doused with water. The coating sells for $4.95 per gal. in 55 gal. drums. Coverage varies from 150 sq. ft. per gal. for cement blocks to 300 sq. ft. for marble.

Manufacturer: The Monroe Co., Inc., Cleveland, Ohio.

(Continued on page 208)







WALLS LIKE CLOTHING... PUT ON IN LAYERS... *Quick!*

You can have walls and roof of Galbestos metal—fire—corrosion—and shatter-resisting, but above all—fast up!

Galbestos metal is Robertson's highly successful protected sheet steel. You can have a wall of just Galbestos on steel frame, or insulated; or Galbestos G-Panel; or Q-Panel. Galbestos metal has been successfully used all over the world on thousands of buildings—industrial, commercial, laboratory and administration; architecturally well designed, in maroon or black or aluminum or in combinations of these colors. Galbestos metal walls are maintenance-free. But above all, Galbestos metal can be erected by the Top-Speed Fastening method quicker than any other type of wall.

Galbestos metal is a proved material—and perfect for your mobilization requirements. Speed fits it for immediate construction; durability and attractive appearance recommend it for whenever your business returns to post-mobilization conditions.

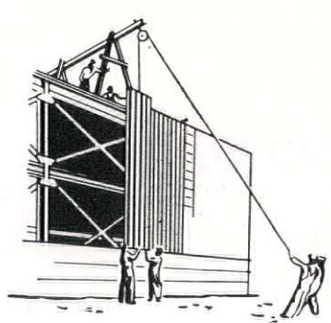
THIS IS GALBESTOS METAL **A steel sheet to which asbestos felt is metallically bonded. The felt is then impregnated with asphalt and waterproofed. Tested and approved by Underwriters' Laboratories, Inc., Chicago, and by the Associated Factory Mutual Fire Ins. Co., of Boston.**





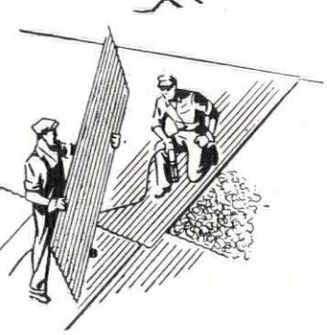
TOP-SPEED METHOD

The Top-Speed Fastening method is done entirely from the outside. It eliminates interior hanging scaffolds. Consequently, this enables a workman to place, safely, twice as much material in the same time as with the old method.



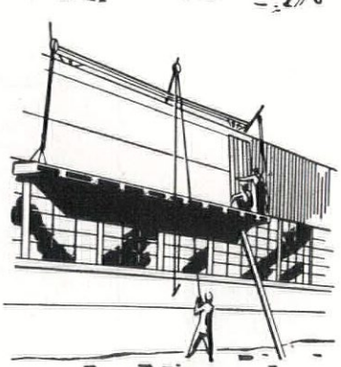
Q-PANELS

Famous Robertson Q-Panels can be surfaced with Galbestos. A Galbestos metal Q-Panel is factory-fabricated; steel inside, insulation and Galbestos outside. Available 2′ wide, in lengths up to 12′, lightweight, only 3¼″ thick, but superior in insulation value to a 12″ masonry wall with furred plaster. A small crew can erect a Q-Panel fast—50 sq. ft. in nine minutes.



TOP-SPEED INSULATION

Top-Speed Insulation is a Robertson method of applying insulation entirely from the outside. It halves the construction time.



G-PANELS

G-Panels are factory engineered but field assembled. Interior steel, then insulation, then Galbestos metal. They are extremely successful for economical, yet attractive, industrial and commercial structures, where insulation is a requirement. You get a tight, maintenance-free wall, lightweight, thin, durable and good-looking.

WRITE FOR FREE CATALOGS

1. Galbestos
2. Top-Speed Fastening
3. Q-Panels
4. G-Panels

H. H. ROBERTSON CO.

Factories in Ambridge, Pa.; Hamilton, Ontario; Ellesmereport, England

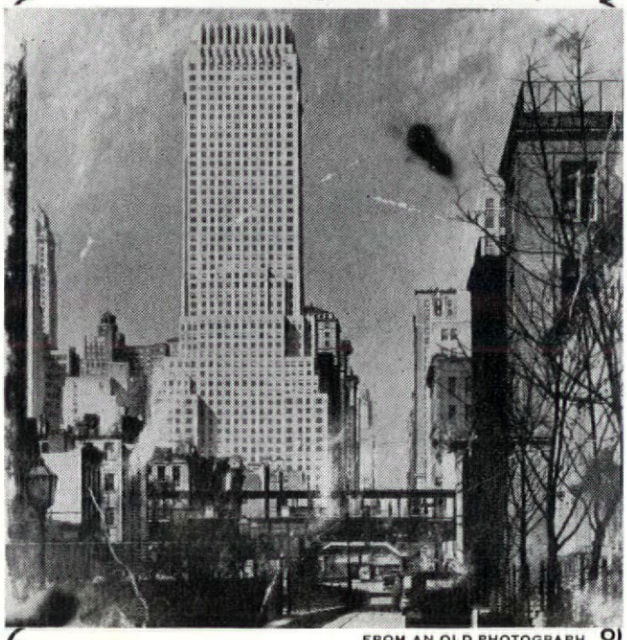
World-Wide Building Service

2403 Farmers Bank Building
Pittsburgh 22, Pennsylvania

Offices in ALL Principal Cities in the U. S. A. and Canada

back in 1929

(when the Chanin Building in New York was built)



FROM AN OLD PHOTOGRAPH

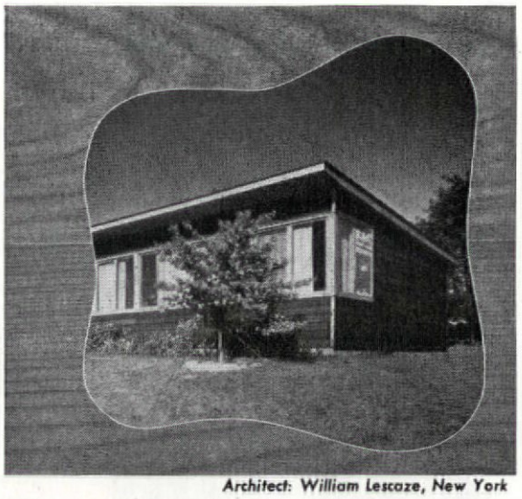
progressive architects were already specifying **Moultile**–the pioneer asphalt tile flooring

(...the **new** Moultile is better than ever!)

Moultile inc.

Joliet, Illinois

Beauty and Economy



Architect: William Lescaze, New York

. . . IN EXTERIOR FINISHES

Cabot's Stains are *beautiful* — they bring out all the loveliness of grain and texture — come in a wide range of colors from clear brilliant hues to weathering browns and grays, many available from no other source.

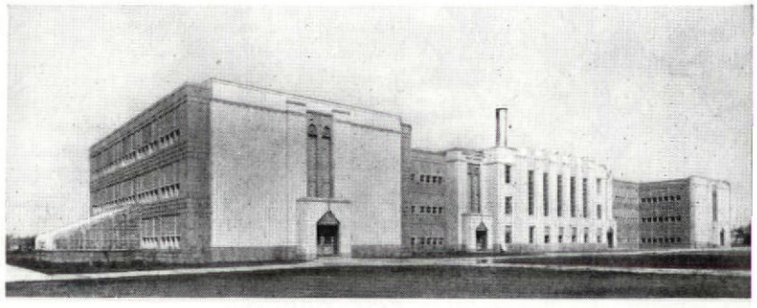
Cabot's Stains are *practical* — 60-90% content of pure creosote oil, the best wood preservative known, preserves the wood and keeps termites out.

Cabot's Stains are *economical* too — they cost less than ⅓ as much as good paint — go on quickly and easily — keep their fresh colors for years.

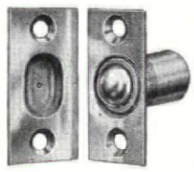
Write Today for color card showing many unique colors available from no other source. Samuel Cabot, Inc. 830 Oliver Bldg., Boston 9, Mass.

Cabot's *creosote stains*

ANOTHER ADAMS-RITE INSTALLATION!



SAMUEL MUMFORD HIGH SCHOOL
DETROIT, MICHIGAN



Approximately 300 Adams-Rite Ball Latches are now in use in cabinets and wardrobes in this imposing Detroit high school. These ball latches, like other Adams-Rite products, are an exclusive design. Unlike the plunger or bullet-type, the Adams-Rite Ball Latch *cannot* jam. It allows the door to open and close easily, smoothly. Tension is adjustable. Write for catalog.

Architects—
McGrath-Dohman, Inc.
Contractors—
Darin & Armstrong, Inc.
Hardware Contractors—
The Rayl Co.

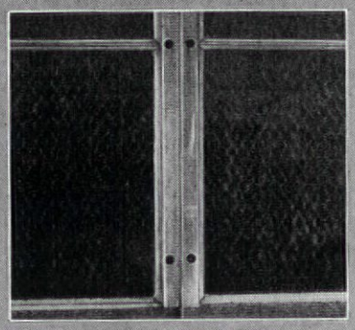
QUALITY HARDWARE FOR OVER HALF A CENTURY

ADAMS-RITE MANUFACTURING CO.

540 WEST CHEVY CHASE DRIVE, GLENDALE 4, CALIFORNIA, U. S. A.

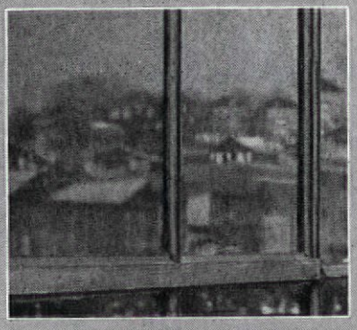
These Strong Steel Windows Have Never Rusted!

(Un-retouched photographs taken in 1950)



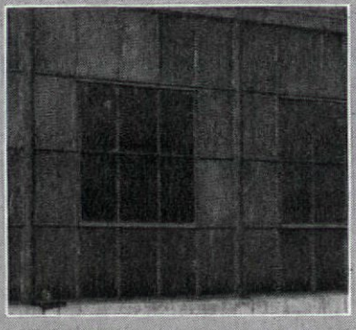
IN TEXAS
INSTALLED IN 1927

Galvanized, unpainted Fenestra Steel Windows in Mallory Pier of Galveston Wharf Company, Galveston—unblemished after a 24-year-long siege of salt spray.



IN MASSACHUSETTS
INSTALLED IN 1928

No rust even after sitting in the steam of the cooking room of the Wm. Underwood Company, Watertown, for 23 years—proof of the protection of hot-dip galvanizing.



IN ILLINOIS
INSTALLED IN 1923

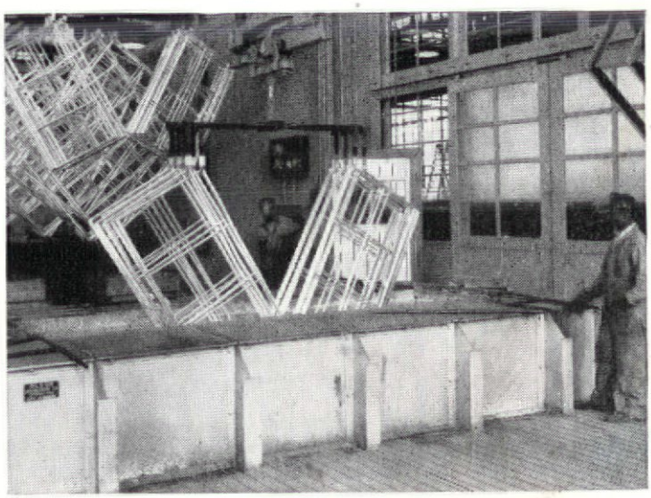
Steel-strong and rust-free, these 28-year-old galvanized Fenestra Steel Windows are still serving faithfully in the steel carshop of the Elgin, Joliet and Eastern Railroad, Joliet.

And Now Fenestra Makes Them *Even More Durable!*

Now Fenestra* engineers have developed a new hot-dip galvanizing system that does an *even better* job—and they've built a brand-new plant around it, the *only* plant of its kind in America. Everything is ingeniously designed to give you *steel-strong* windows that really *eliminate* painting and save you maintenance money year in and year out.

First, the assembled frames are hung from the conveyor separate from the assembled ventilators. Then automatic controls move these assemblies from tank to tank—dipping them, lifting them, controlling each temperature, timing every move.

From degreasing to pickling to hot and cold rinsing to fluxing and drying they go. Then when finally they are perfect for galvanizing, they dip deep into molten zinc. Then they are Bonderized, which prepares the finish to take decorative painting if it's ever desired. Then they are rinsed again. And with every segment of surface, corner, joint and edge covered by locked-on galvanizing, the frames and their vents go to final assembly . . . and to you.



RISING UP out of molten zinc in the great Fenestra galvanizing kettle, these windows will *never* need painting!

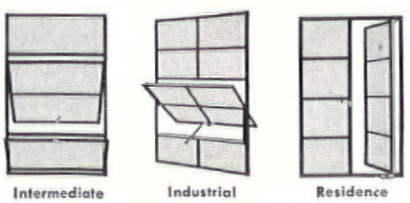
So see them today. Call the Fenestra Representative (he's listed under "Fenestra Building Products Company" in your Yellow Phone Book) or write Detroit Steel Products Co., Dept. MB-6, 2251 East Grand Blvd., Detroit 11, Michigan. *®

Send for Your Free Illustrated Book on Fenestra Hot-Dip Galvanizing

Steel-Strong Windows made to STAY new

Fenestra

HOT-DIP GALVANIZED STEEL WINDOWS



Intermediate Industrial Residence



BATH ENCLOSURE

Cascade

BEAUTIFUL
COLORFUL
PRACTICAL

An entirely new concept in bath enclosures. Rigid sliding panels of Plexiglas in beautiful transparent pastel colors of crystal clarity: Pink, Gold and Crystal Clear.

Can be installed at a cost much less than a glass panel enclosure.

Plexiglas is shatterproof, withstands heat, resists water and has strength far beyond requirements present in the home bathroom.

Simple to install: (1) Cement track to rim of tub, (2) rest panels in track and adjust top rod in position, (3) fasten end plates of top rod and the job is finished. Made to fit a regular 5 foot recessed tub.

Available from your plumbing contractor.

Write for bulletin showing the Cascade Bath Enclosure in actual colors.

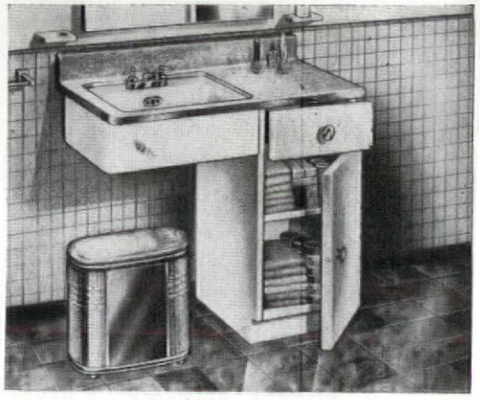
FIAT

FIAT METAL MANUFACTURING COMPANY • *Three Complete Plants*
(Chicago area plant) Franklin Park, Illinois • Long Island City 1, New York
Los Angeles 33, Calif. • In Canada: Porcelain and Metal Products, Ltd., Orillia, Ontario

PRODUCT NEWS

BATHROOM FIXTURE serves as lavatory, dressing table and storage cabinet

Within its compact 3′ length, 32″ height and 20″ depth, the LaMode bathroom fixture provides a large wash basin, storage space, and vanity. Constructed of heavy gauge steel finished in baked white enamel, the unit is designed to be fastened to the wall for support. No leg is needed in the open space beneath the lavatory. The top and back splash are gray plastic lami-



nate and the 20″ x 18″ x 7″ basin is finished in acrid resistant porcelain enamel. Installed price, including sink and drain hardware, is around $120.

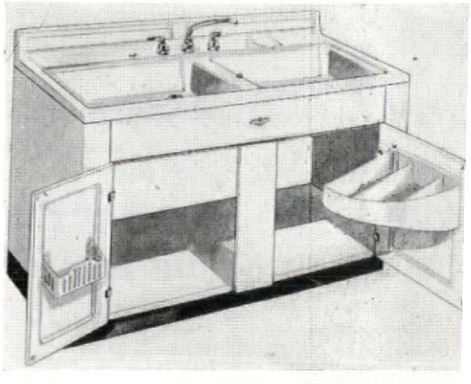
Manufacturer: U. S. Porcelain Enamel Co., 463[illegible] 52 Drive, Los Angeles 22, Calif.

DOUBLE SINK carries modest price tag

A 4′ cabinet sink with two bowls is being introduced by Youngstown Kitchens this month. The twin bowls, each 7″ deep, and 4″ high backsplash with impressed soap dish make up the one-piece porcelain-on-steel top. Retailing at $129.95 plus installation, the new model features a cutlery shelf with three compartments conveniently located on the inside of the right hand door. Other equipment and accessories include chromium plated swinging mixing faucet, crumb cup strainers, a soap box rack on the left hand door and a large undersink compartment. The sink is 3′ high and 2′ from front to back. Its doors are sound deadened, and the die-made construction is said to eliminate sharp corners.

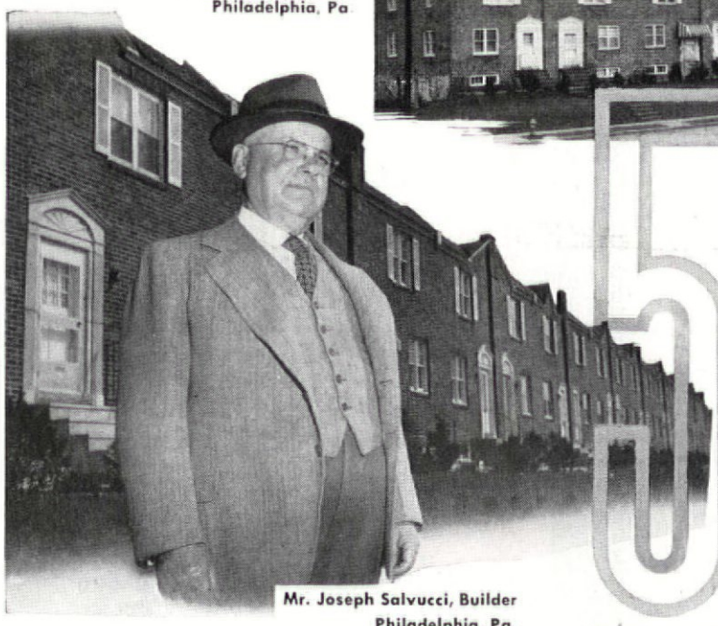
Manufacturer: Mullins Mfg. Corp., Warren, Ohio.

(Continued on page 212)



50 two-story homes, Philadelphia, Pa.

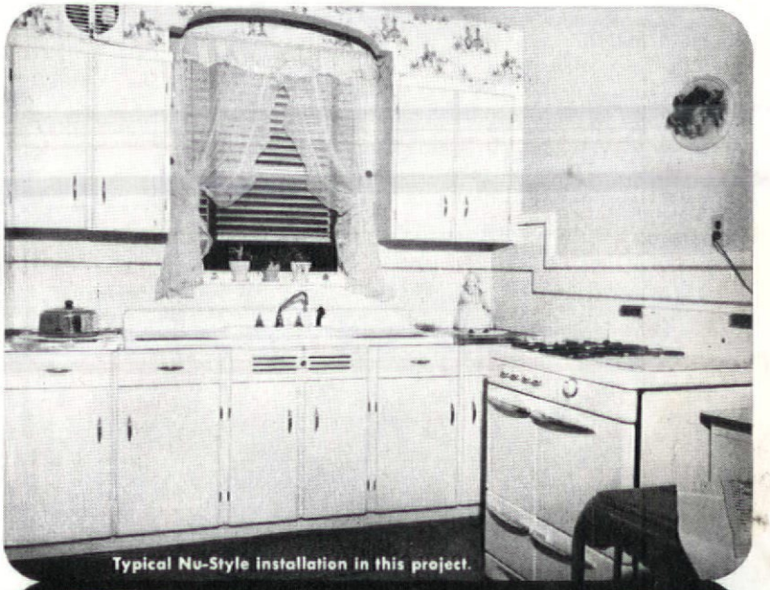




Mr. Joseph Salvucci, Builder
Philadelphia, Pa.

50 BILT-WELL Nu-Style kitchens in this project

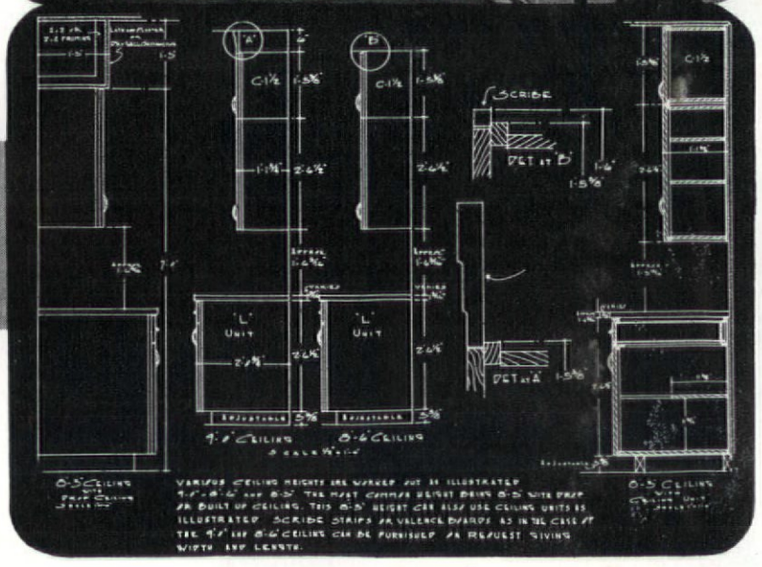
Bilt-Well cabinets offer convenience and beauty to attract and hold good tenants. This, of course, results in good rentals returned to the investor. Bilt-Well Cabinets are manufactured of kiln-dried Ponderosa Pine, sanded to a satin-smooth surface, ready for painting or natural finish. Specify Bilt-Well Nu-Style Cabinets on your next commission—get acquainted with all these cabinets have to offer in convenience and beauty.



Typical Nu-Style installation in this project.

CARR, ADAMS & COLLIER CO.
BILT WELL WOOD WORK *DUBUQUE, IOWA*

BILT-WELL
NU-STYLE UNIT-KITCHEN CABINETS



FAMOUS BILT-WELL LINE OF WOODWORK

Mantels & Telephone Cabinets • Multiple-Use & Linen Cabinets • Stair Parts • Nu-Style Cabinets • Superior Unit Wood Windows • Exterior & Interior Doors • Entrances • Shutters • Clos-tite Casements • Carr-dor Garage Doors • Basement Unit Windows • Louvers & Gable Sash • Breakfast Nooks • Combination Doors • Screens & Storm Sash • Corner (China) Cabinets • Gli-dor Cabinets • Ironing Board Cabinets

TRUSSED Design ... makes the Difference



It is architectures oldest reinforcing principle, applied to top quality steel reinforcing. Exclusive with patented Dur-O-wal.

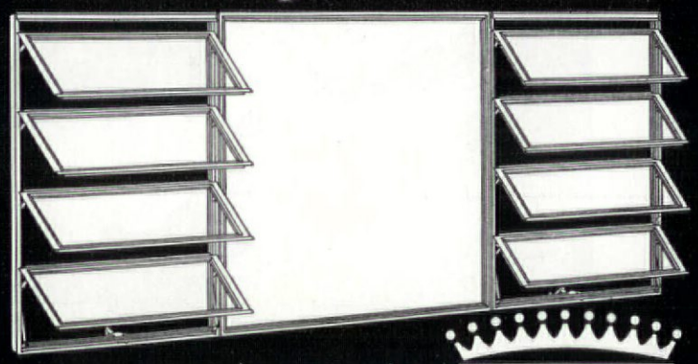
Patented Dur-O-wal provides a rigid steel reinforcing for all masonry walls. Trussed design means maximum strength for crack-free construction. Dur-O-wal is embedded in mortar joint; ideal as a unit to tie face brick to back-up block. Send for complete information from Dur-O-wal plant nearest you.

DUR-O-WAL

CEDAR RAPIDS BLOCK CO.
Dur-O-wal Div., 650 12th Ave. SW
Cedar Rapids, Iowa

Dur-O-wal PRODUCTS, Inc.
P.O. Box 628
Syracuse, N. Y.

LEMCO Monumental



Series 62

EXTRUDED ALUMINUM AWNING WINDOWS



***NOW AVAILABLE** in limited quantities.*

Write or wire today for additional information.

AMERICA'S OLDEST CASEMENT WINDOW MANUFACTURER

Croft STEEL PRODUCTS, INC.

16 MARKET STREET • JAMESTOWN, N.Y.

DODGE Vinyl-Cork TILE

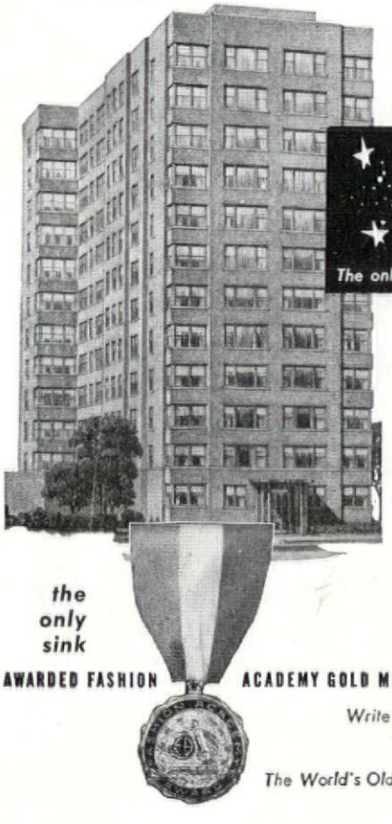
Quiet

The sound-deadening quality of the resilient cork base provides an unusually quiet floor.

DODGE CORK CO., INC., LANCASTER, PA.

For detailed information and test data, see Sweet's File, Architectural 13g—or write for Do catalog.

ARCHITECT: Frank A. McNally & Assoc.
BUILDER: 5858 Sheridan Corporation
PLUMBING WHOLESALER:
Warren Barr Supply Co., Chicago



America's finest sinks for America's finest buildings



The only sink guaranteed to outlast your home

Everlasting Beauty — Prestige — Minimum Maintenance of *Elkay Lustertone Stainless Steel Sinks* add a distinctive mark to the kitchens in this modern apartment . . . add rental appeal and re-sale value to any building or home—new or old alike. *Lustertone* remains permanently bright, unstained and untarnished . . . never needs scouring or bleaching.

the only sink

AWARDED FASHION ACADEMY GOLD MEDAL FOR EXCELLENCE OF DESIGN

Write for literature and prices

ELKAY Manufacturing Co.
The World's Oldest Manufacturer of Stainless Steel Sinks
1898 S. 54th Ave., Chicago 50

Famous Contractors Approve when The THORO System Products are— *Specified*

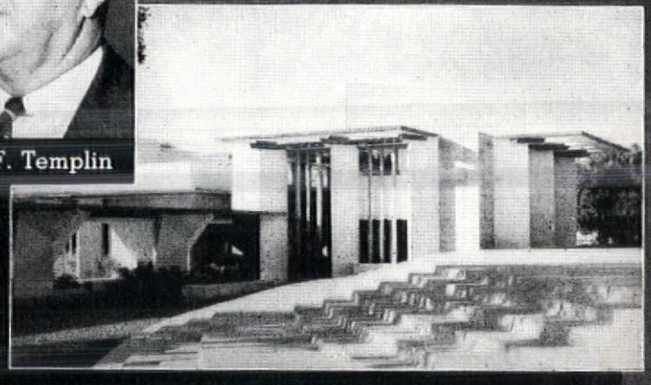
Here's what John F. Templin, outstanding General Contractor, Lakeland, Florida, has to say . . .



Showing 1 of 18 buildings constructed for Lakeland's Florida Southern College. All with Thoroseal on exterior surfaces. John F. Templin, General Contractor.



John F. Templin



Thoroseal Protection, Architect, Frank Lloyd Wright, General Contractor, John F. Templin.

TEMPLIN'S, INC.
General Contractors
940 East Main Street
LAKELAND, FLORIDA

Mr. Bert J. Long,
Standard Dry Wall Products,
New Eagle, Penna.

November 16, 1950

Dear Mr. Long:

Prior to 1944 we tried numerous kinds of materials for waterproofing masonry construction. Since we began using Thoroseal and Quickseal six years ago we have been entirely satisfied. Not only have all of our applications been highly satisfactory, but their use is economical.

Your distributor for central Florida, Mr. Thomas N. Morrison, Lakeland, has proven himself to be as reliable in representing your merchandise as are the products themselves.

On the basis of our experience with Thoroseal and Quickseal we gladly recommend them for waterproofing and for beautification.

Sincerely Yours,

TEMPLIN'S INC.,
By John F. Templin

JFT-k

"Weathering the elements of Florida has been a continuous battle for years for most contractors in a climate of heavy rains, boiling sun and hurricane winds. That's why you'll find leading builders recommending the famous Thoro System Products. For over 39 years, these materials have been given a rugged test that shows them tops on most home builder's programs."

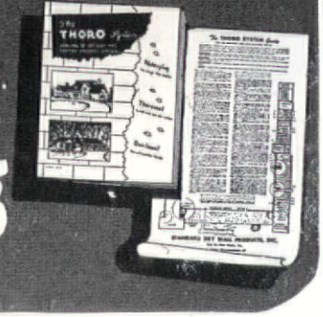
"The range of colors and the lasting brilliance of Thoroseal and Quickseal makes them a number one sales feature for the contractor who emphasizes quality at minimum cost."

39 YEARS OF SOUND BUSINESS REPUTATION

EXPERIENCE, in the preparation of materials for masonry protection and maintenance,— in every case means, success or failure!

With THORO System Products, the designer secures 100% protection by complete sealing of the surface, combined with exceptional beauty and color.

Write today for our new 20 page brochure 17-A and designer's wall chart.



Standard Dry Wall Products

NEW EAGLE PENNSYLVANIA



For keeping cool in August, Miss Sno-Breeze (left) offers a Palmer Mfg. Corp. fan. U. S. Plywood proves conclusively (below) that its Weldwood fire door resists flame and intense heat from either side.



WALL COATING gives any type paint a rough plaster-like finish

Adtex, mixed half and half with any kind of paint—oil, water or rubber based—produces finely textured coatings for walls and ceilings. These finishes may be brushed on or applied with a stipple roller. They are especially effective on drywall paneling where taped seams might otherwise be dead giveaways under ordinary flat paints. Thicker consistencies of Adtex mixtures are claimed even to mask the untaped butted edges of wall board; and regular proportions will fill and cover hairline cracks in plaster construction. Paint drying time is not affected by the additive; with casein paints, however, hardening takes a little longer. While it does not noticeably alter the shade of paint to which it is added, Adtex does reduce the paint's odor. Coatings with this fine grain silica are said to be effective for outside applications on brick, stucco and porous masonry as well as for inside uses. Added to Oncrete, another of the manufacturer's products, Adtex produces a non-skid concrete floor coating. Retail price is $3.95 per gal.

Manufacturer: Lowebco, Inc., 1525 E. 53 St. Chicago 15, Ill.

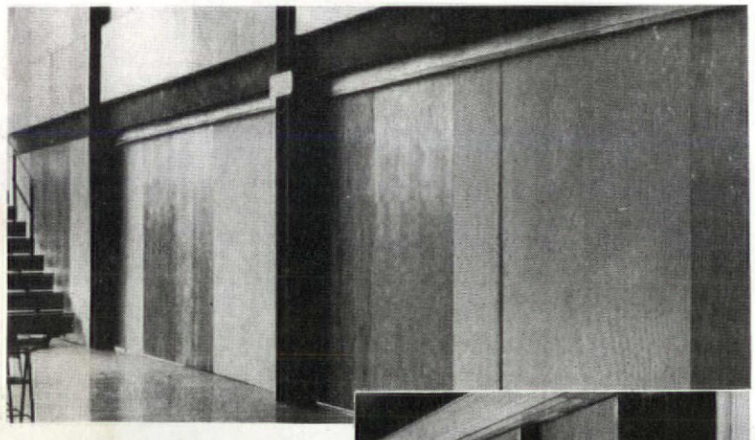
MULTICOLOR PAINT. Speedy durable finish for drywall construction

By using a spray coat of an unusual and attractive multicolor lacquer, two men can paint the entire interior wall and trim surfaces of two small houses in a single day—about one-fifth the time spent brushing on conventional finishes. Like Maas & Waldstien's *Plextone* which was introduced last year in the Levitt houses, Multikolor consists of clusters of pigment suspended in a lacquer base. Two to five colors are contained in the standard line mixtures, but Multikolor may be purchased in any combination of specified shades in orders of 50 or more gal. When pressure-sprayed through a large gun orifice, the color particles are uniformly distributed on the wall surface. The lacquer dries

(Continued on page 216)



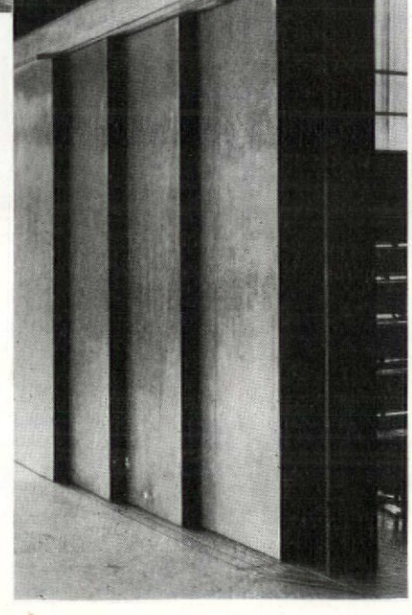
unitslide partitions by Fairhurst TRADEMARK at the CORNING GLASS CENTER



UnitSlide Partitions drawn out to form a solid wall. Lower right: Units slide back to stacked position parallel to opening.

Contractors
George A. Fuller Co.

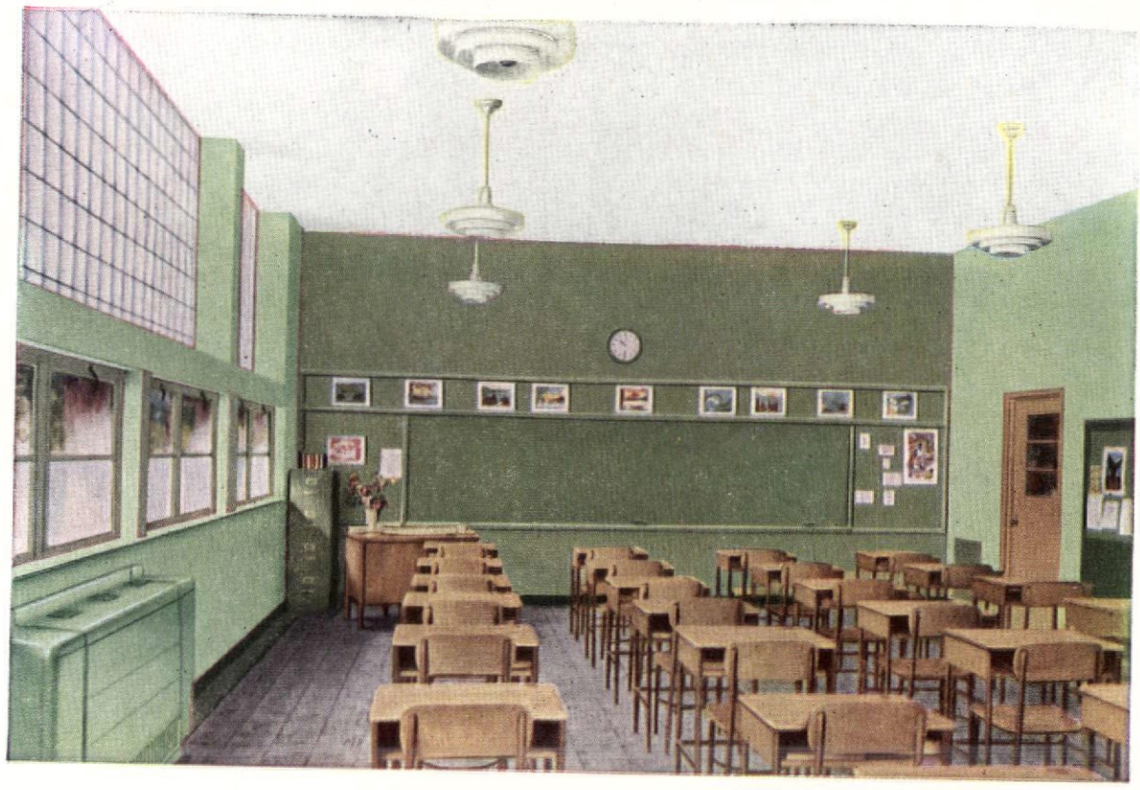
Architects
Harrison & Abramovitz



. . . incorporate the Newest Improvements in Sliding Wall Construction . . . These UnitSlide walls in the Corning Glass Center are distinguished by functional beauty, unusually large dimensions and smooth, simplified operation. New exclusive advantages:

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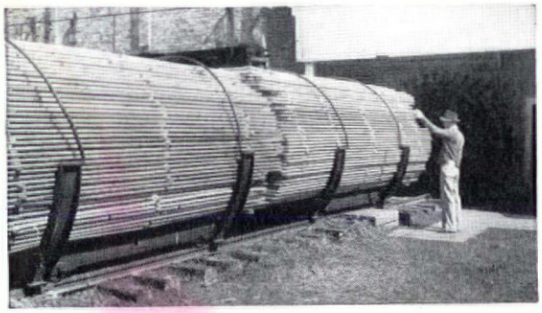
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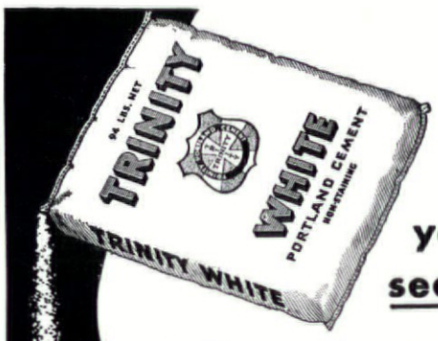
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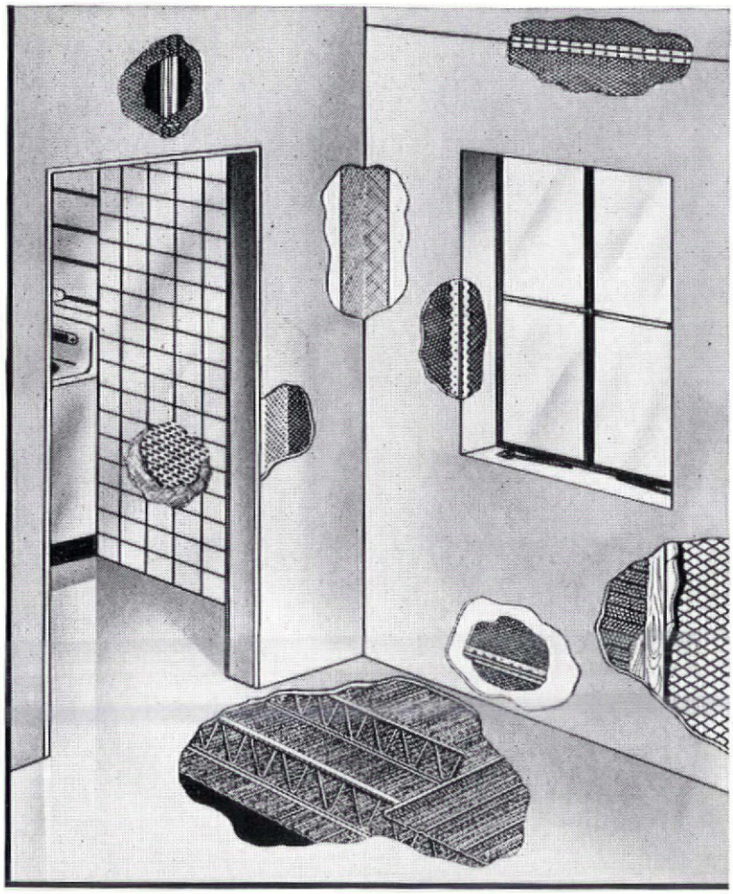
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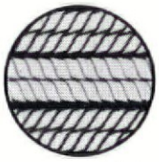




Diamond Lath



Herringbone Doublemesh



Ribplex Lath



Self-Furring Diamond Lath



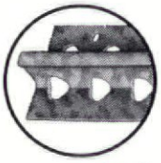
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dust free in 30 to 40 minutes, and may be handled in two hours. The delicately patterned coatings effectively mask cemented wall board joints, and hide surface flaws on plywood and plaster. They may also be applied over concrete (damp or dry) and cinder block. They have tough wearing qualities and are extremely washable. Prices, f.o.b., New York City, are $3.75 per gal. for Multakolor and $2.85 per gal. for the thinner. Discounts are allowed on quantity orders.

Manufacturer: United Lacquer Mfg. Corp., 1001 West Elizabeth Ave., Linden, N. Y.



There is no danger of flame failure in the Norge gas range. Electric coils spark the burners.

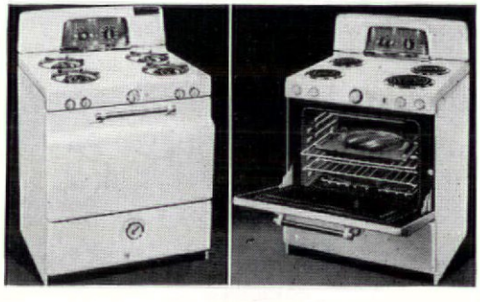
GAS RANGE with electrically ignited pilot wins safety award

A gas range with electric glow coils (instead of the conventional continuously burning gas pilots) took top honors at the Sixth National Home Safety competition sponsored by New York City's emporium for glamorous gadgetry, Lewis & Conger. The coils work like a car cigarette lighter and are operated by push buttons while the gas cock handles are turned on with the other hand. The range's oven, as well as each pair of top burners, has a separate igniter so that the risky practice of using matches for lighting ovens and the threat of the pilot flame being extinguished by a draft are both eliminated. Other features of the kitchen appliance are its porcelain lined oven, which has a glass window and oven light, and two vertical compartments with adjustable shelves for flexible storage space. Approved by Underwriters' Laboratories and the American Gas Assn., the electrically ignited gas range comes in two models which retail for about $230 and $250.

Manufacturer: Norge Div., Borg Warner Corp., Merchandise Mart Plaza, Chicago 54, Ill.

SMALL RANGES have big cooking facilities

Featuring full width ovens, unique in 30″ wide ranges, the Kalamazoo Golden Jubilee gas and electric stoves meet the need for compact appliances that will fit into budgeted space kitchens and still do family-sized jobs. The ranges also have convenient dial cooking charts printed on the inside of the heat-tempered glass tube oven



handles. Smokeless "broiling over glass" is another design innovation in the new models which should appeal to homemakers. The gas and electric ranges are similar in appearance, each standing 36″ high and 25½″ deep, and having four burners and divided cook tops. Glareless diffused light from a fluorescent lamp behind a glass panel softly floods the work area. Retail price for the standard gas range is $159.50; for the standard electric, $179.50. Other deluxe and automatic units sell for from $229.50 to $319.50.

Manufacturer: Kalamazoo Stove & Furnace Co., Kalamazoo, Mich.

(Continued on page 218)

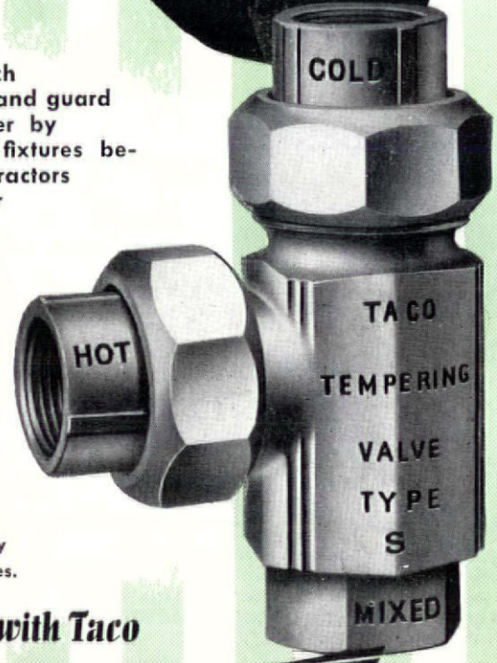
Reduce complaints about excessively Hot Water with
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Taco Tempering Valves stretch Tankless heater performance and guard against excessively hot water by maintaining temperature at fixtures between 115° and 160°F. Contractors find these valves *reduce their call backs on new jobs.*

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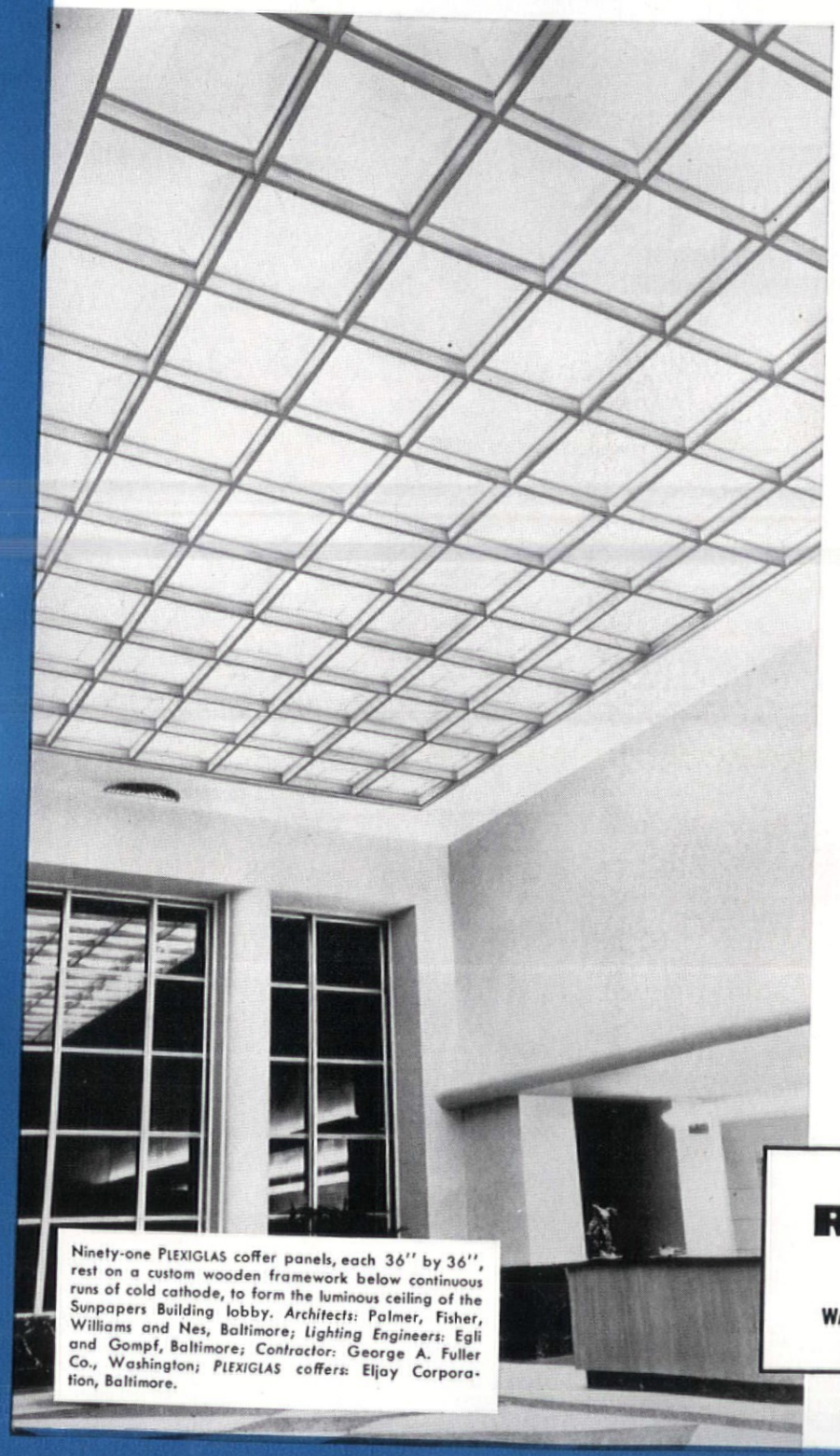


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How a PLEXIGLAS Luminous Ceiling Solved a Design Problem



Ninety-one PLEXIGLAS coffer panels, each 36" by 36", rest on a custom wooden framework below continuous runs of cold cathode, to form the luminous ceiling of the Sunpapers Building lobby. *Architects:* Palmer, Fisher, Williams and Nes, Baltimore; *Lighting Engineers:* Egli and Gompf, Baltimore; *Contractor:* George A. Fuller Co., Washington; PLEXIGLAS *coffers:* Eljay Corporation, Baltimore.

Problem: To light this spacious, high-ceiling lobby of the new Sunpapers Building in Baltimore, and maintain its clean architectural design. Solution: A luminous ceiling of PLEXIGLAS acrylic plastic panels.

With PLEXIGLAS luminous ceilings, lighting becomes an architectural component, not a design afterthought. The white translucent diffusers — corrugated, flat, or formed into three-dimensional shapes—conceal lamps, ducts and pipes *completely*. Yet the output of the lighting source is utilized fully, due to high transmission efficiency. The luminous area overhead is the visible source of light—a lighting fixture as big as a room.

Other advantages: Complete, uniform diffusion; high illumination levels with low source brightness; control of brightness ratios; reduction of glare, shadows, and specular reflection to a minimum; the creation of a luminous environment. And the light weight and strength of PLEXIGLAS give freedom from breakage during installation and maintenance, and safety overhead in service.

Our new booklet—PLEXIGLAS LUMINOUS CEILINGS—outlines design considerations and presents case studies. Write for your copy today.

A substantial volume of PLEXIGLAS production, now at record levels, is required for the defense mobilization program. The supply available for civilian applications is limited.

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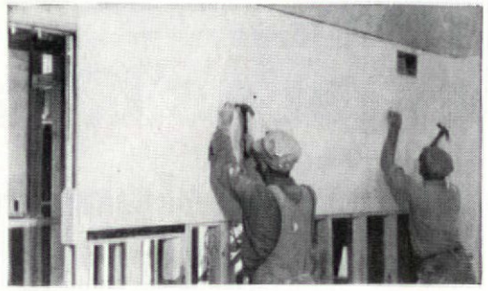
Representatives in principal foreign countries

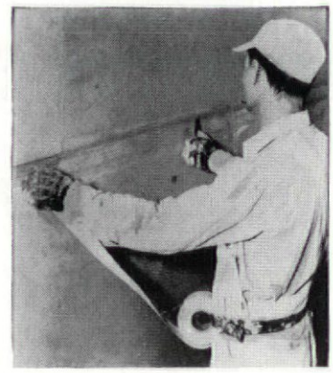
PLEXIGLAS *is a trade-mark, Reg. U. S. Pat. Off. and in principal foreign countries.*

Canadian Distributor: Crystal Glass & Plastics, Ltd., 130 Queen's Quay at Jarvis Street, Toronto, Ontario, Canada.

FIRE RESISTANT PLASTER BOARD offers apartment builder dry wall economies.

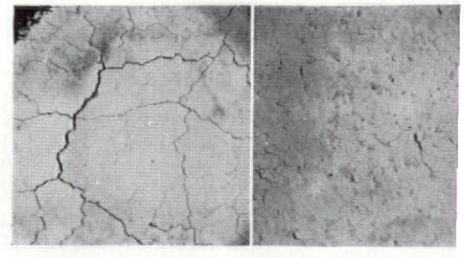
Combining advantages of dry wall construction —speed and ease of application and decoration —with up to three times the fire protection of conventional gypsum paneling, Firestop Bestwall plaster board is gaining acceptance rapidly in many cities for small apartment house and commercial construction. (Chicago, for one, okays this dry wall material because it meets the performance type code requirements. Other





cities which have given Firestop the nod ar Birmingham, Cleveland and Detroit.) A sing layer of the specially processed Firestop Bes wall in the 5/8" thickness applied to both sid of a 2 x 4" wood stud load bearing partitic was tested and approved by Underwriters' Lab ratories for 1 hr. fire resistance. The same m terial used as a ceiling finish under a 2 x 1(wood joist floor also passed the 1 hr. fire e durance test. The ½" board used single laye on both sides of a wood stud load bearing pa tition and, applied as ceiling finish, received 45 min. rating. (Ordinary gypsum panels ½ thick carry only a 25 min. rating as a ceili finish.) Single layers of the ¾" Firestop sin larly applied to walls and ceilings gave ½ h fire protection.

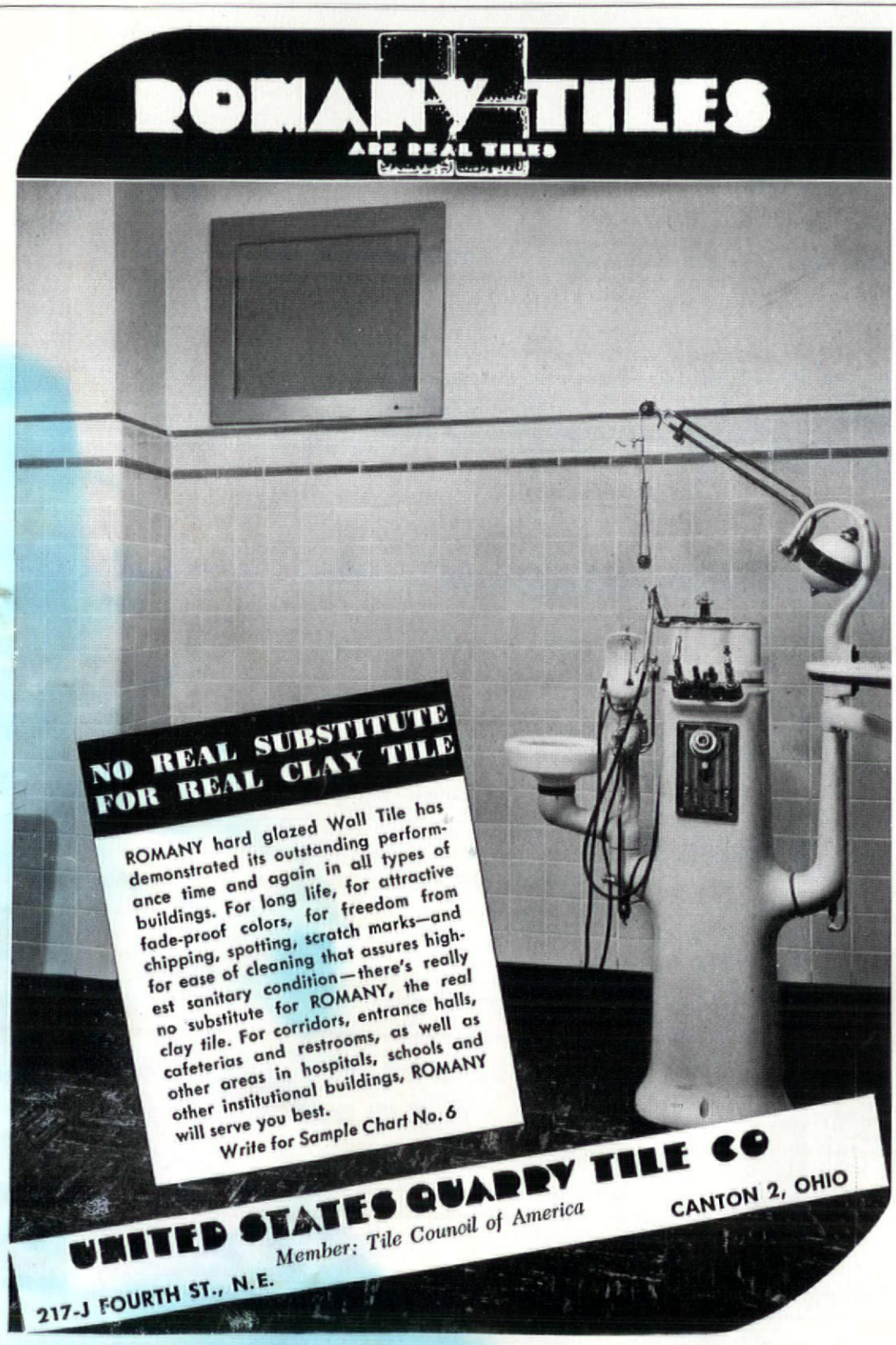
To increase the natural fire resistance of gy sum board, Firestop's manufacturer added sm amounts of asbestos fibers and unexpanded v miculite. The gypsum's fire protection re largely in its water content—50% by volume which acts as an integral sprinkler system unc high temperatures. Even after the chemica bound water has been driven off by extre heat, the asbestos fibers in Firestop ret their strength and help bind the core. the same time, the vermiculite aggregate, w dispersed in the core material, expands un heat to balance the shrinkage of the gypsum it loses water. Thus a solid face of calci gypsum stays in place. The photos below sh close-ups of a conventional gypsum board (le and Firestop panel (right) which have b subjected to fire temperatures of 1700° F. fo



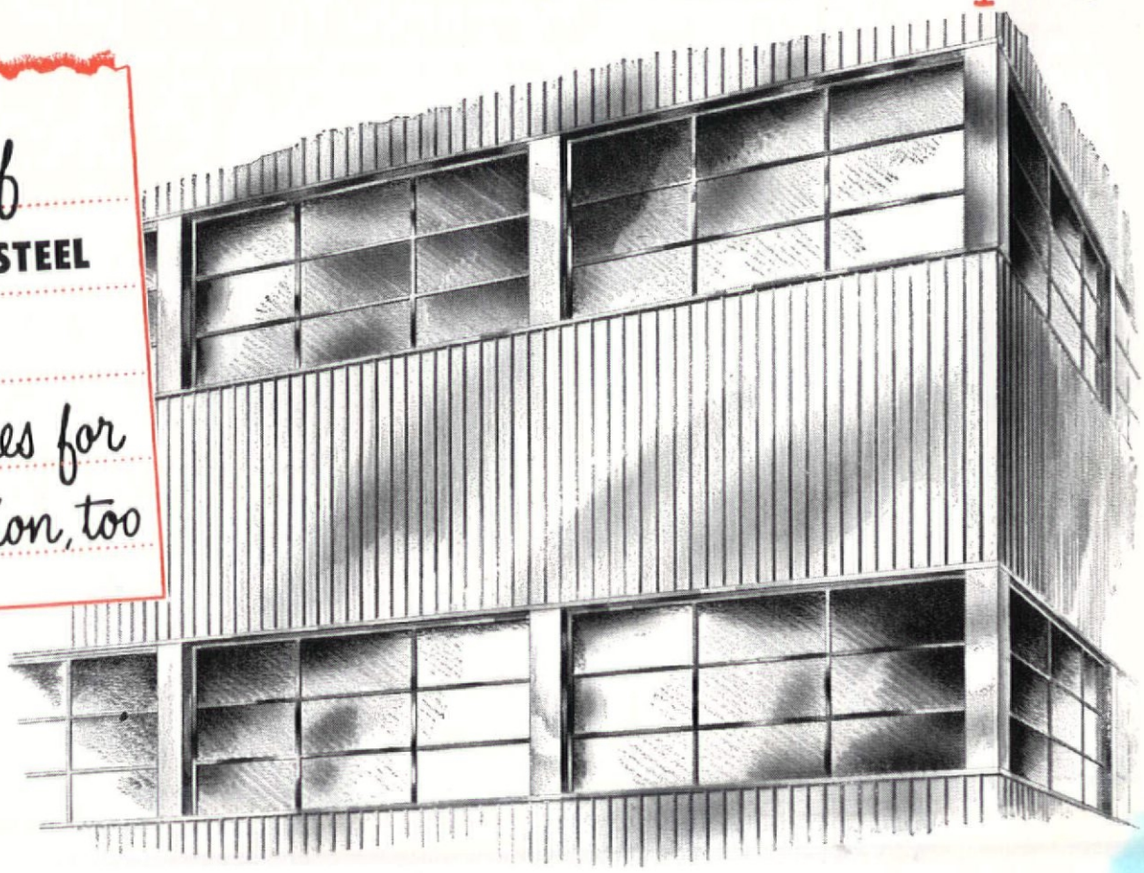
hr. Shrinkage cracks, which allow passage heat and lessen the fire protective propertie the board, appear only in the unreinforced sum material.

Firestop Bestwall is made in 3/8, ½, and thicknesses in sheets 4' wide and 8, 10, and long. The sheet edges are recessed for sm taped seams. Cost of the 5/8" material is a $70 to $75 per 1000 sq. ft.—about $10 r than for the same amount of regular gyp board.

Manufacturer: Certain-teed Products Corp., more, Pa.

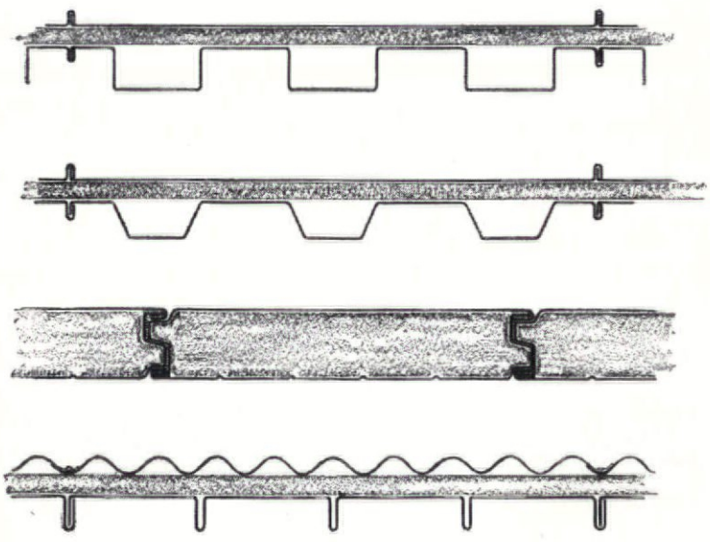


Exteriors of U·S·S STAINLESS STEEL offer great possibilities for plant construction, too



Typical industrial plant exterior utilizing U·S·S Stainless Steel to the fullest extent. Variety in design may be achieved by using panels of any standard, fluted or formed section.

Representative examples of panel manufacturers' sections. They include exterior wall, insulation and interior wall.



WHEN considering the possibilities of steel exteriors, don't overlook their adaptability to the design of industrial and commercial buildings. In the type of application illustrated here, U·S·S Stainless Steel offers the combined advantages of simplified construction, minimum maintenance and clean, modern lines.

In the sketch, panels, windows, corners and mullions are all U·S·S Stainless Steel. The completely insulated panels are erected in interlocking sections 18 to 24 inches wide. Insulation can be applied to meet any building code requirement.

Combined with structural steel frames and steel floors, wall construction of this type offers you a building that is completely modern . . . completely efficient . . . and permanently good looking.

This is the third in a series of suggestions indicating the possibilities of Stainless Steel exteriors for modern buildings. We hope you find them a worthwhile addition to your planning file. If you have missed any of the series, you may complete your file by writing to United States Steel Corporation Subsidiaries, Room 4276, 525 William Penn Place, Pittsburgh 30, Pennsylvania.

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UNITED STATES STEEL

Lighting problems and the acoustical ceiling

Good lighting goes hand-in-hand with acoustical treatment. Since both of these elements usually make use of the ceiling area, it is good practice to consider lighting and sound-conditioning problems together.

The acoustical ceiling as a light reflector

Nearly every type of lighting fixture depends upon other light-reflecting surfaces within the room. These surfaces not only help to balance illumination by softening shadows, but they reinforce direct light. Thus, they can reduce the number of lighting fixtures required, as well as the power supply necessary for the system.

Obviously, it isn't always practical to paint rooms in light colors to gain high reflection. In addition, lighting authorities point out that light-colored reflective surfaces should be kept high in the room rather than below eye-level where they can cause annoying areas of brightness. That's why acoustical materials, factory finished in white, play such an important part in room lighting. All materials in the Armstrong Line are made with special white finishes capable of reflecting more than 75% of the light. Their surfaces will not produce glare.

While high reflectivity is usually desired in a ceiling material, there are cases where the opposite characteristic is more important. Where unusual dramatic lighting effects depend on direct "spot" illumination, for example, it may be desirable to repaint the ceiling in a dark, light-absorbing color. In using ultraviolet fixtures, as employed in certain hospital areas, it is often necessary to safeguard against burns resulting from excessive reflection. In such areas, the special fire-resistant finish available on Armstrong's Cushiontone (to meet Federal Specifications for a "slow-burning" material) is an ideal choice. While it reflects 78% of "white" light, it reflects only 4% of ultraviolet.

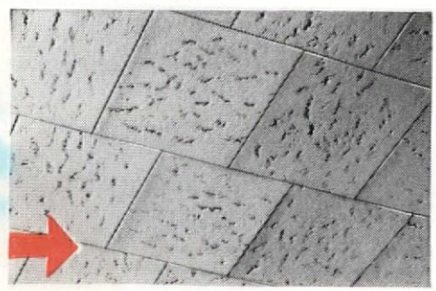
Ceiling appearance

Although acoustical materials are designed for attractive appearance with all types of lighting fixtures, there is a special problem with fixtures located on the same plane as the ceiling, as in cove lighting. Here, light grazes across the ceiling and quickly shows up even the smallest variation in the surface of the tiles, resulting in an appearance of uneven shadows. Variations of as little as .005 of an inch become visible. More suitable, therefore, are either recessed or suspended fixtures. In cases where grazing light cannot be avoided, it's best to use factory-kerfed acoustical tiles, installed with fiber splines at the corners, and cemented in place. Tiles held in place mechanically by suspension systems also provide a smoother surface.

Installation

Manufacturers have standardized sizes and designs so that nearly all acoustical materials and recessed lighting fixtures fit together without difficulty. Suspended lighting fixtures are easily fastened to acoustical tile ceilings. Because it is so easy to cut through most acoustical materials, it may often save time to make openings for fixture locations after the ceiling is installed. In addition, since it is a simple matter to replace one or two acoustical tiles, relocation of old fixtures is made less expensive.

Frequently, acoustical mechanics and electricians can save time by working together, particularly when recessed troffers are being installed with suspended metal-pan systems. Both the fixture hangers and the pans are simply snapped into place, on the same "T-runner." A special advantage of this metal-pan system is that the individual units are quickly and easily removed for access to wiring. Thus, separate access openings may be eliminated.



Light from the side is bad
Cove lighting is grazing across the surface of this Armstrong's Travertone acoustical ceiling. Harsh shadows result. Even the most perfectly installed tiles will appear uneven with this type of lighting, for it emphasizes ceiling irregularities of as little as .005 of an inch.



Light from below is good
Here the Travertone ceiling is evenly lighted by a suspended fixture. The surface appears smooth and regular, the light is properly diffused, and softer shadows bring out the full beauty of the fissures. Recessed lighting fixtures are also suitable for acoustical ceilings.

Because of their light weight, all of the acoustical materials are highly adaptable to use with the suspended ceilings or troffers required by recessed lighting. Where a suspended ceiling is planned—particularly in remodeling—consideration should be given to lowering the new ceiling as much as practical. This not only increases acoustical efficiency by moving the absorbing material closer to the source of sound but also increases the effectiveness of lighting fixtures.

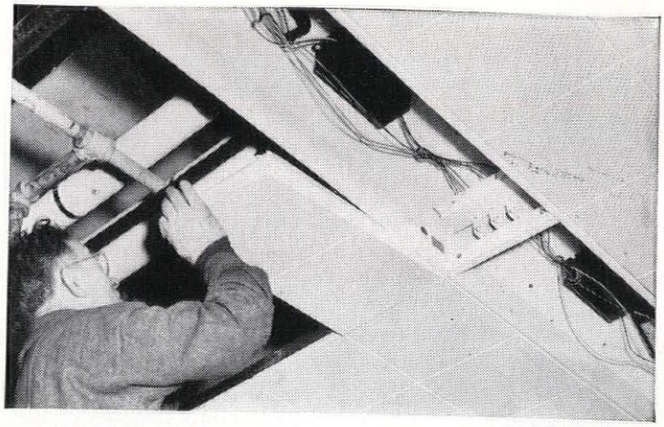
Maintenance is important

Both electrical manufacturers and acoustical tile manufacturers emphasize the importance of cleaning ceiling surfaces and lighting equipment regularly. That's because dirt reduces the transmitting qualities of the lamp and the reflecting qualities of fixture and ceiling. "Lost" light may range as high as 20% of the actual lamp output.

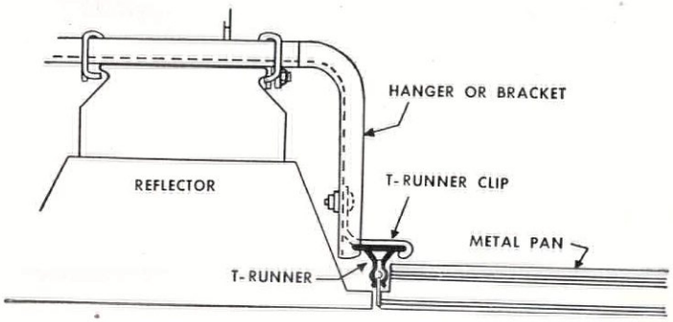
Most acoustical materials are easy to clean because of their smooth paint finish. Usually, they can be cleaned by wiping with a damp cloth or, more quickly, by brushing or vacuuming. Repainting may sometimes be necessary, especially in localities where dirty air is a problem. Although most acoustical materials are repaintable, those with perforated surfaces are best suited to repeated painting without loss of acoustical efficiency.

Adaptability to lighting is only one of the considerations in selecting an acoustical ceiling material. The Armstrong Line offers a full choice of materials to meet other special requirements, such as fire resistance, low cost, beauty, moisture resistance, thermal insulation, and easy maintenance. Your Armstrong Acoustical Contractor can give you valuable help in selecting materials and solving many kinds of acoustical problems.

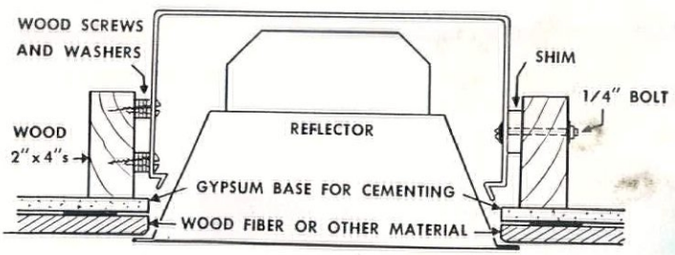
SEND FOR FREE BOOKLET, "How to Select an Acoustical Material," which answers many questions about sound conditioning. Write Armstrong Cork Company, 5408 Stevens St., Lancaster, Pennsylvania.

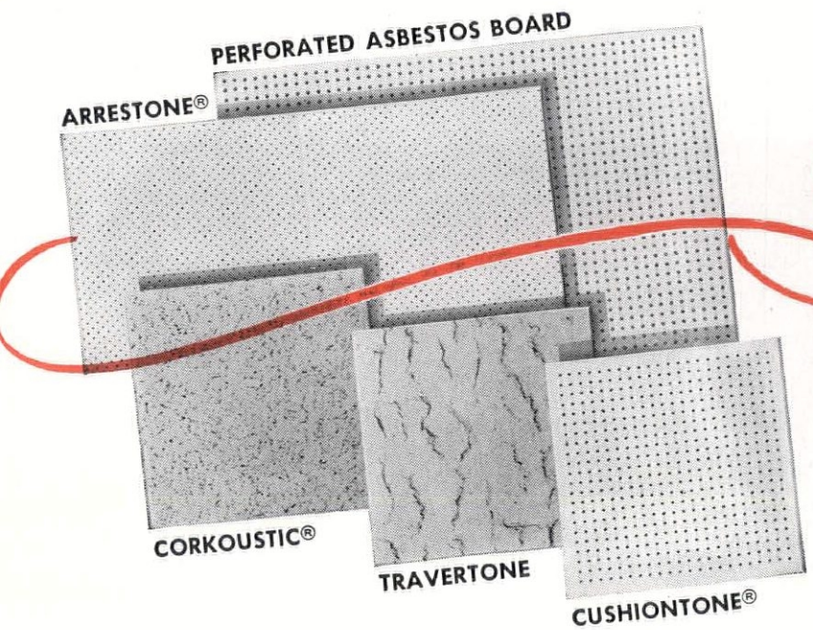


Armstrong's Arrestone, a metal-pan acoustical material, is quickly and easily installed. The metal pans and flush-type troffer lighting fixtures are well adapted to each other. To save time, electricians and acoustical men often work as a team.



Details of installation are shown above for mechanically suspended Armstrong's Arrestone and a typical flush-type lighting fixture. Below, a fixture is fitted with wood fiber or other acoustical materials on a ceiling of wood construction.



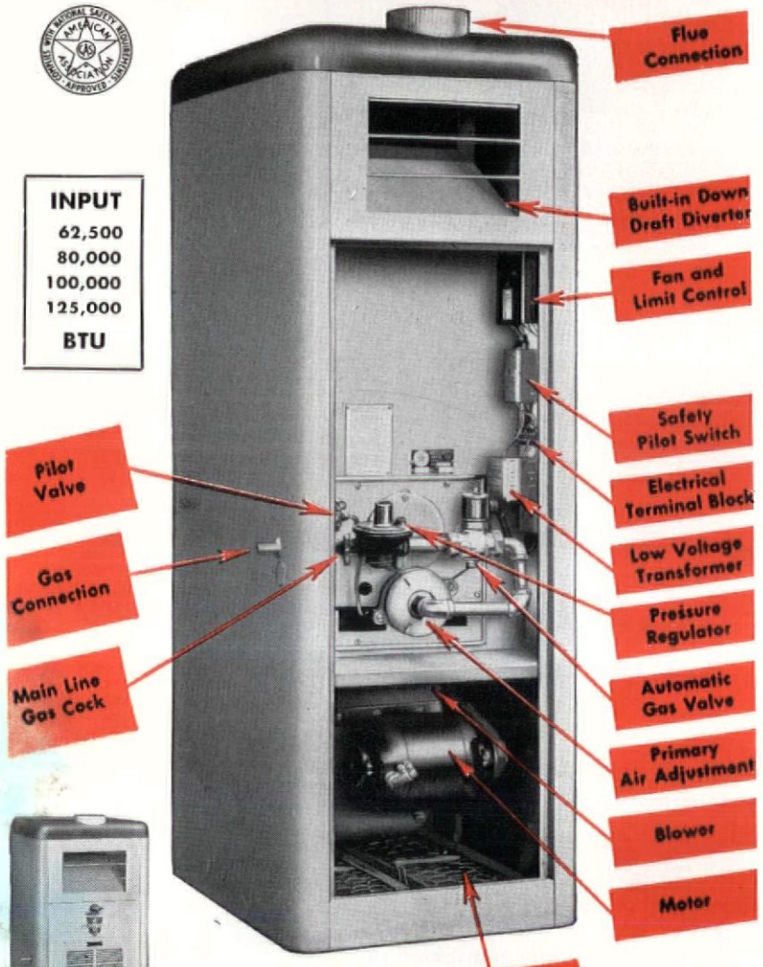


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Eliminates Duplicate Stock . . . Completely Factory-Assembled in One Package!



For Basement Installations

Yes, sir . . . TWO-IN-ONE because only standard Security SFA Furnaces need be kept in stock. Factory-assembled and wired to serve in closet-type or usual basement-type installations. Return air duct connector for basement application is shipped knocked down . . . can be attached to the back or to either side in a matter of minutes.

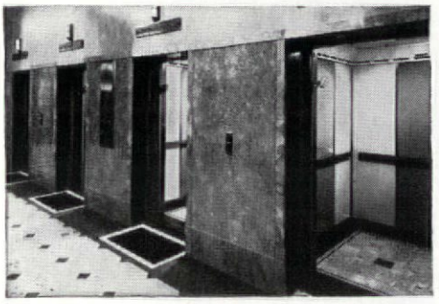
All controls are located in one compartment. Quick, accurate adjustments . . . easy replacements are expedited without disturbing other wiring. Built-in filter racks can be placed at installer's option.

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WHEN A BUILDING NEEDS A LIFT

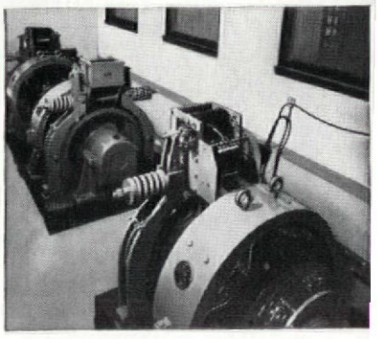


Fast, quiet operation, smooth starts and stops, and above all, dependability are features both building owners and the public want in elevators. New elevators in Seattle's Medical-Dental Building embody all of these requirements in an attractive design, the result of combined engineering skills of Montgomery Elevator Company and General Electric. When your building needs a real lift, specify G-E elevator motors and control. *General Electric Co., Schenectady 5, N. Y.*

Above: Smooth operation, perfect automatic leveling, fingertip control, electric door operation, attractive cabs add up to faster, more comfortable vertical transportation. Each of the four cabs, which serve ten floors, has a capacity of 3000-lb at 800 fpm.

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Right: G-E shunt-wound, gearless traction motors, rated 45 hp, 270 volts, provide dependable, limited maintenance service. They have 36-in. sheaves with U-grooves for one-to-one roping, and are equipped with solenoid brakes.



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GENERAL ELECTRIC

665-112

ROUND TABLE RECOMMENDATIONS

(Continued from page 123)

or other improvements. We believe FHA should permit all mortgages to be drawn to meet the first of these needs through the package mortgage plan and the second of these needs through the open end mortgage plan. VA approves both these mortgage forms everywhere, but FHA will not insure any open end mortgage and some of its offices will not insure complete package mortgages.

The homeowners of America have a combined estimated equity of $150 billion in their homes. The open end mortgage would allow them to use this equity as a basic instrument of credit.

In later years, on the other hand, it is natural for the homeowner to seek relief from the ½% charge for FHA insurance after his loan has been reduced to around 60% i.e. the point where conventional financing should normally be available to him at the same interest rate without the insurance cost. Even on houses which are not resold, a large percentage of FHA home loans are now refinanced within ten years.

This refinancing is apt to cost the homeowner several hundred dollars, usually including a new title search (and the high cost of title search is often one of the worst features of the real estate market in this country). The money thus wasted on refinancing could much better be applied to amortization, and we suggest that FHA mortgages should be written in the first place so that after a certain period the insurance charge would automatically be reduced.

We believe FHA collects comparatively little insurance now on mortgages which can be refinanced more cheaply with conventional loans, and consequently it would lose very little by ceasing to collect the full insurance premium from the few who now continue to pay it.

We believe the incentive of saving on the FHA insurance premium as soon as the mortgage is paid down to 50% would encourage homeowners to accelerate their amortization payments in the early years

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Color is important to any building interior. Not just any color, but color selected on a *scientific basis.*

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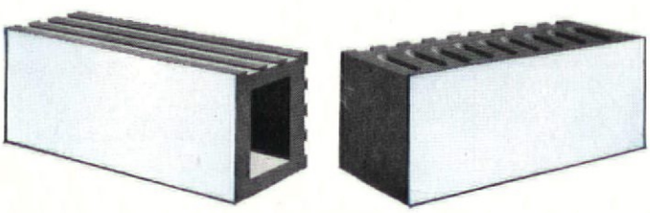
This important new book tells you how to select functional colors for any building interior . . . schools, hospitals, public buildings, commercial and industrial buildings. It tells you how to select colors to help building interiors accomplish their purpose . . . help increase production and morale, aid lighting, reduce accidents.

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Title_____

Street_____

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(Continued from page 131)

The Center is based on regular 20′ x 20′ bays marked by naked steel frame as undeviatingly as any building by Mies van der Rohe, and for a very good reason: by this system you can plan a certain size skeleton first, fit the plan in afterwards. At the start Corning's directors were not half so certain just *what* they wanted in their building as they were that they wanted it in time for their 1951 early-summer centenary. Actually Fuller Construction Co.'s Lou Crandall broke ground as late as August 21, 1950 and turned over the keys as early as May 19, 1951. To help him do this, the steel order was given for 100,000 sq. ft. of floor space before the plan was filled in on the drawing boards.

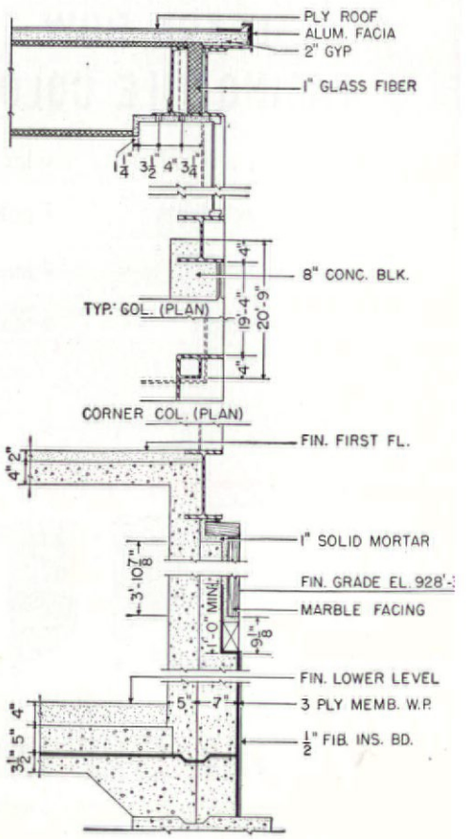
This procedure gave the architects some planning headaches. The budget limitations hurt still worse on mechanical equipment. By deliberate choice a ventilating, not an air conditioning, system was installed; by now there are plans to air-condition the library and the Steuben showroom.

Such minor inadequacies, however, bother neither of the Houghtons. They are very happy indeed with their unprecedented Glass Center. It does better than give their industry a show place; it has given their industry a character and a face to present to our industrial society as a whole. And other industries too can benefit from the prototype of a facility through which to meet the public, the community, and employees.

Ezra Stoller—Pictor



In an area with no codes to require encasement o steel for fireproofing, Harrison, Abramovitz & Abb designed a naked frame to be painted dark blu Glass fiber insulation carefully detailed was used t beat condensation.

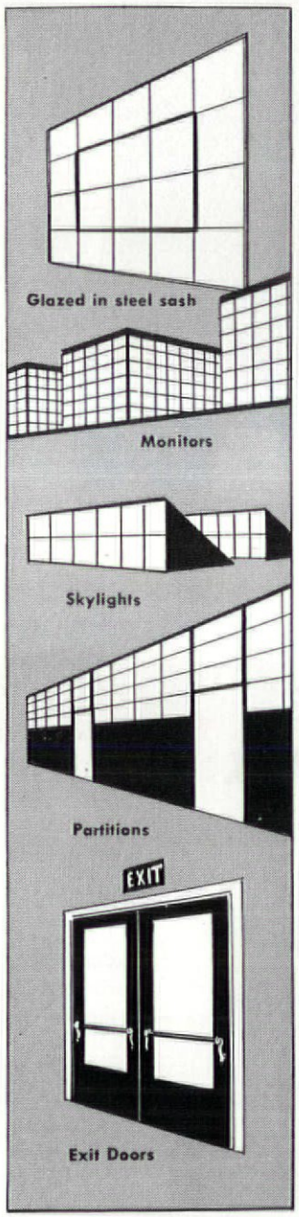




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Storefronts, like the one pictured on this page, will be as strikingly luxurious 25 or 30 years from now as they are today. All the maintenance required is an occasional washing with mild soap and water. As for cost—considering all things—Stainless is actually the most inexpensive material available for such purposes.

At present our distribution is dictated by essential needs. In the future we will fill your need for stainless steel.



Stainless Steel tile has been used inside and outside with excellent results.



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SHARONSTEEL

ROYAL FESTIVAL HALL ACOUSTICS

(Continued from page 180)

Box shape

Thus we have two seemingly contradictory demands that must be met in a music hall: (a) fullness of tone, and (b) definition. The questionnaire surveys have indicated that, at least among British listeners, the general preference is for more singing tone even at some sacrifice of definition, if necessary. It was therefore decided to make the general shape of the Festival Hall something approximating a rectangular box, (see Figure 4), but with certain modifications suggested by the studies. One important modification is the gathering in of the orchestral end of the hall by sloped ceiling and side wall sections. There is also a partial-height sloped rail at the immediate sides of the orchestra seating area. These changes correct one of the major faults of a simple rectangular plan: long delayed echoes from side wall surfaces near the front of the room. Instead, the sounds striking the surfaces near the orchestra are thrown toward the rear of the hall, thereby reinforcing the sound received at seats further removed from the source.

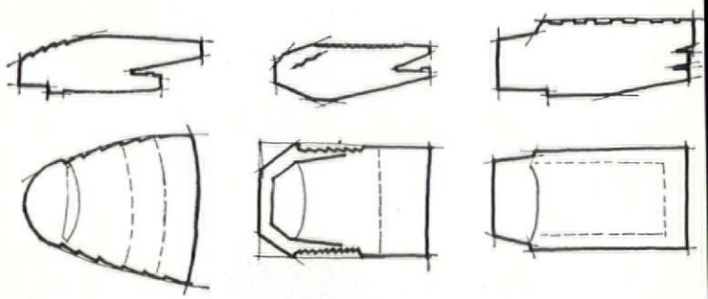


Fig. 4: (left to right) Kleinhans Music Hall fluid shape producing reinforcement and definition of tone. Royal Festival Hall—definition and singing tone. Symphony Hall, Boston—blended, singing tone.

Facing slopes

Another departure from classical music hall practice is the very steep floor section, running down to a hard reflecting area from which the orchestra platform slopes steeply upward. Thus the orchestra and the main floor audience are on steep hills facing each other, without the usual platform separation. The direct path from each sound source to each listener passes well above the intervening floor surface over most of its path. The "sound lines" are exceptionally good, and with this comes an increased strength of the direct sound relative to the sound reflected from walls and ceiling. But this ratio between direct and reflected (or reverberant) sound is probably the key to the question of definition discussed above. Perhaps in the Royal Festival Hall we will find *both* high definition and fullness of tone.

Reflector

The definition should be further enhanced by the dropped overhead reflector above the orchestral instruments. This reflector, Figure (p. 228,) has an undulating wooden surface parts of which direct the sound outward to the audience while other parts scatter some of the sound back into the orchestra itself. These back reflections help the members of the orchestra to play in balance and in unison. The Royal Festival Hall appears, at least on paper, to have reconciled definition with fullness of tone.

Reverberation and absorption

The more conventional problem of reverberation control has been admirably handled in the design. Optimum reverberation time for the room (750,000 cubic feet, seating about 3,000) would be about 1.7 seconds at 500 cycles

(Continued on page 228)



the New Look in
ENGINEERED FIRE SAFETY

No longer must you sacrifice the beauty of modern interior design in order to have absolute fire safety. Newly developed "Automatic" 400" Ceiling Sprinklers provide two kinds of appeal—beauty and protection. They're designed to blend perfectly with the most tastefully arranged interior, whether office, retail establishment, restaurant or public building. And—they provide ceiling visibility, unlimited—are practically unnoticeable, yet, are ready to combat fire whenever called upon to do so.

Finished in finely polished bronze or chrome, "Automatic" 400" Ceiling Sprinklers project less than one inch below the ceiling surface. They are easily installed in new buildings and may be used in remodeling any type of occupancy where piping for the existing sprinkler system has been concealed.

Full particulars on the "Automatic" 400" Ceiling Sprinkler are available through our nation-wide network of district representatives or you may write direct for descriptive literature.

Plan a "disappearing act" for your fire protection with "Automatic" 400" Ceiling Sprinklers.



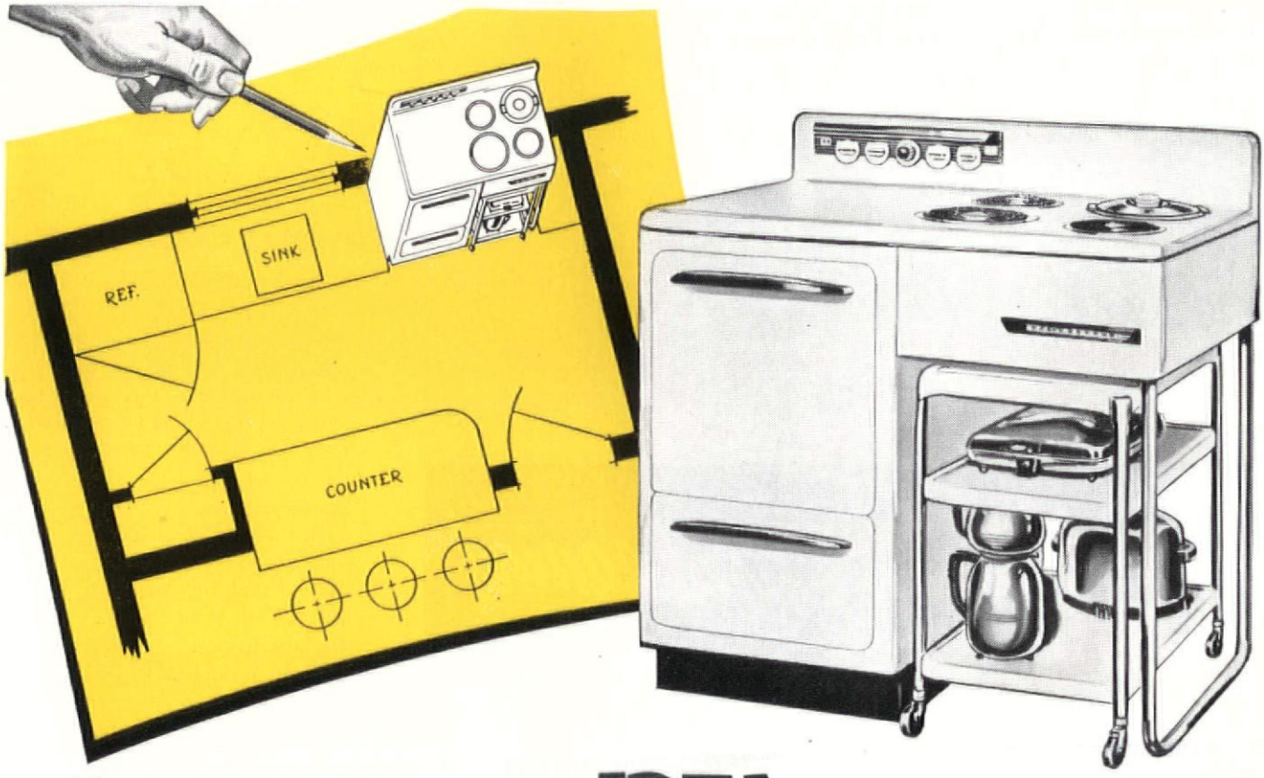
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You're looking at an IDEA that Makes Space Work Overtime

Kitchen storage is at a premium in most small houses and apartments.

One way to help beat this problem is with the Westinghouse Rancho Range. The tuck-away space will accommodate a roll-out table. In effect, you are adding 7⅓ square feet of table top and shelf area storage in addition to big range cooking capacity . . . without construction cost.

This combination offers the residents flexibility of use. The table can be moved anywhere, can be used as a teacart. Or, the tuck-away space can be used to house a kitchen stool, wastebasket or to straddle a radiator or register.

Here, again, is another example of the originality and adaptability of Westinghouse-designed Appliances. Look through our new 1951 catalog, you'll find that Westinghouse Appliances offer many opportunities for flexibility in planning homes for electrical living. Send for your free copy, today.

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Please send me a copy of your new 1951 Appliance Catalog.

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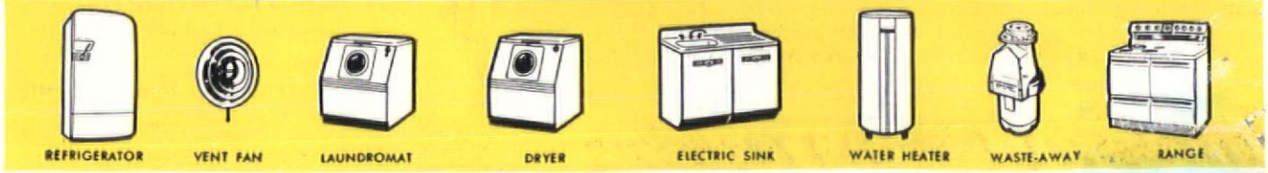
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second by current American practice, and about 2.2 seconds by British recommendations. An intermediate value was selected for the initial design of the Festival hall, and allowances were made for some adjustment of reverberation characteristics after its completion. *Particular attention was given to the frequency balance to obtain a uniform reverberation value except for a slight rise at low frequencies.*

In a room of this size it is difficult to maintain enough reverberation at the higher frequencies

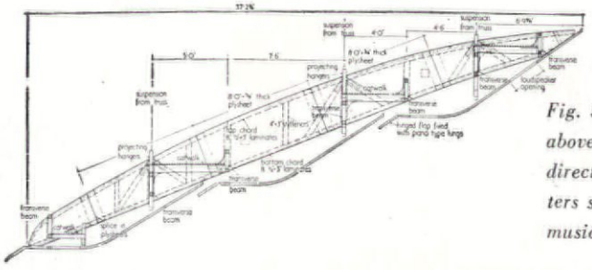


Fig. 5: Detail of dropped overhead reflector located above orchestral platform. Undulating wood surface directs part of sound outward to the audience, scatters some sound back into orchestra itself. This helps musicians to play in balance and in unison.

because conventional acoustical materials, clothing, carpets, and the air itself provide considerable absorption in this range. Carpets and high frequency absorbing finishes were kept to a minimum. On the other hand, low frequency absorption is deficient in conventional finishes.

This hall has large surfaces of wood paneling on the walls (see Figure 6) which have an absorption coefficient of about .50 at 125 cps, dropping to the order of .05 at 500 cps. The panels are 3/8" thick and are backed with air spaces that alternate between 3" and 4" in depth. Also there are two sizes of panel, and the panels are randomly braced, in order to spread the frequencies of the maximum absorption.

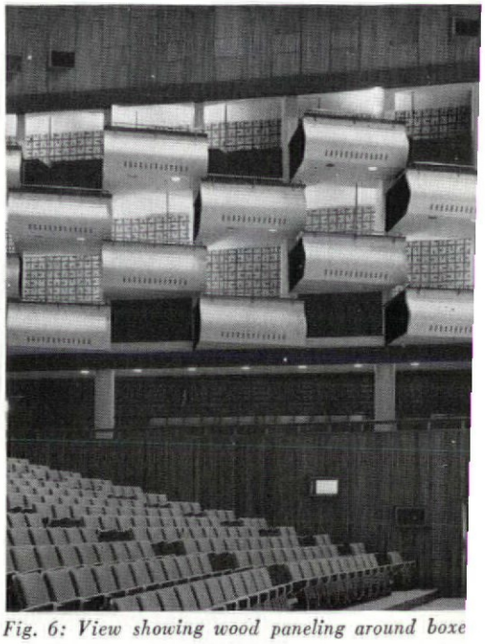


Fig. 6: View showing wood paneling around boxe

Perhaps the most interesting sound absorpti treatment is the "Copenhagen ribbing", Figur 7 and 8 (p. 230.) Sound passes through gaps b tween adjacent ribs and is absorbed by thi pads behind. This treatment is effective in t low and middle frequency range. The rear wa and some of the surfaces behind and around t boxes are faced with padded leather back with rock wool which in turn has an air spa behind it. Provision was made in the hall resonator absorbers consisting of small ho leading to a cavity behind the plaster of t ceiling. These holes were plugged initially, they can be unplugged in any number desi

(Continued on page 230)

CLOW CAST IRON PIPE (THREADED) used again!



Artist's conception of beautiful new Florsheim Building recently erected in Chicago.

34 Tons of Clow (threaded) CAST IRON PIPE Used in Construction of Modern Building

Once again, Clow Cast Iron Pipe has been chosen for all 3-inch and larger downspout, waste and vent piping because of its lasting, non-corrosive qualities. In this up-to-date building 34 tons—nearly 5,000 feet—of Clow Pipe was cut, fitted and installed for these services.

Here's why the Architects specified (threaded) Cast Iron Pipe:

Shaw Metz and Dolio, the Architectural firm, specified cast iron pipe because it gives long life service and has the corrosion-proof qualities so important in an all-modern building such as this.

Result: the costly replacement of worn out installations is avoided—because it's an accepted fact that Clow Cast Iron Pipe has a useful service life of more than a century.

Clow Cast Iron Pipe originally was specified for this new building by the Architects. When the owners considered using a comparatively less expensive type of piping, they were assured that such a substitution would be a false economy—due to the far greater life expectancy of the Clow Pipe.

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PLUMBING CONTRACTOR: *M. J. Corboy Co.*

Clow (threaded) Cast Iron Pipe has same O. D. as wrought pipe, is available with plain or threaded ends, in 3, 4, 5, 6, 8 and 10" sizes in 18' random lengths. Also available with integral calking hub on one end (other end plain) in 18' random lengths in 4, 6 and 8" sizes.

CLOW CAST IRON PIPE CAN BE

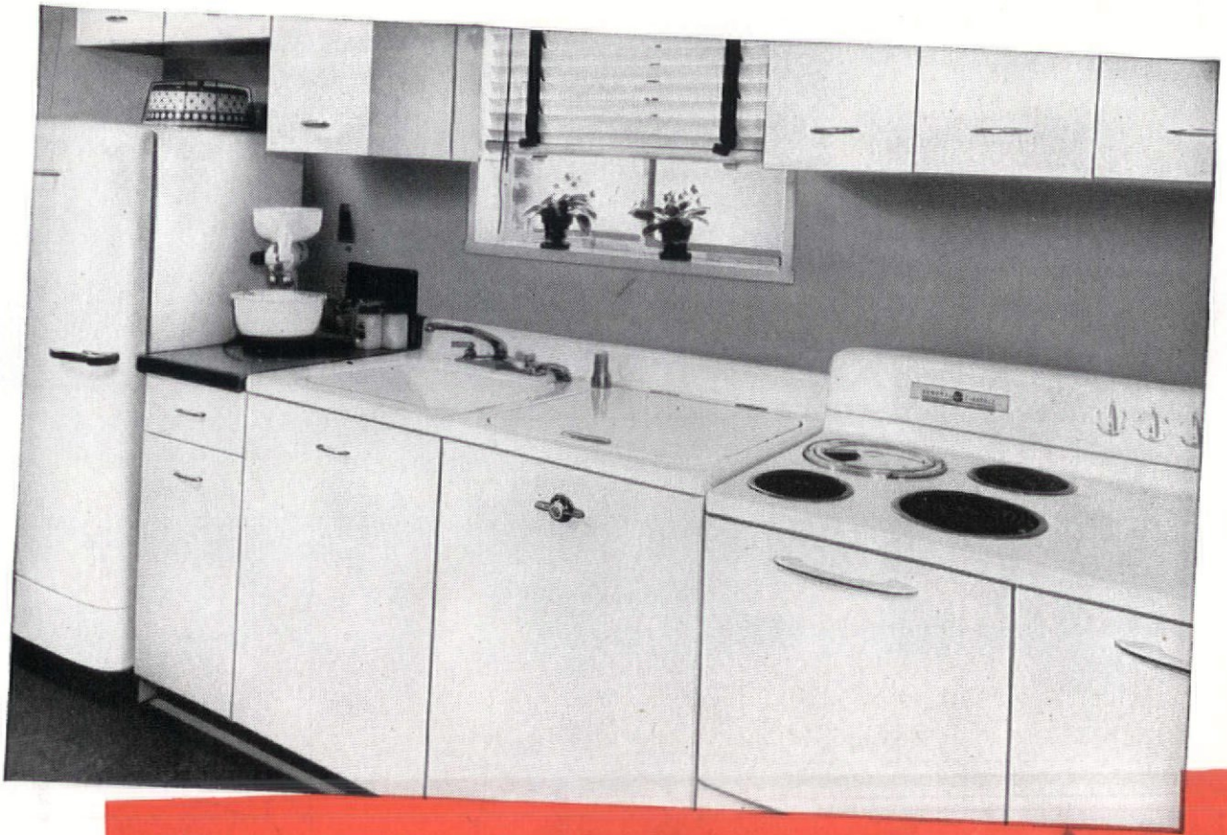


on the job, with ordinary tools of the piping trade.

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▲ Most people don't expect to find a kitchen like this in a moderately priced home. Cost variations depend upon number of rooms, optional basements and fireplaces. But one thing *all* include is the 4-appliance electric kitchen. And the range? Of course . . . it's *Electric!*

◀ The beautiful but modest exterior of a house by Brisker and Campitelli doesn't indicate the electric convenience that exists within. But once inside, the prospective home buyer sees the Electric Range, refrigerator, food waste disposer and dishwasher, and she's *sold!*

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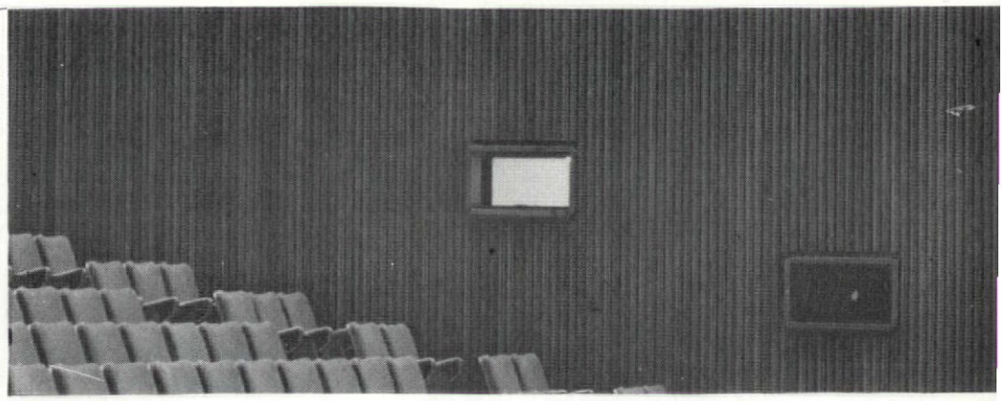
ADMIRAL • COOLERATOR • CROSLEY • DEEPFREEZE • FRIGIDAIRE • GENERAL ELECTRIC • GIBSON
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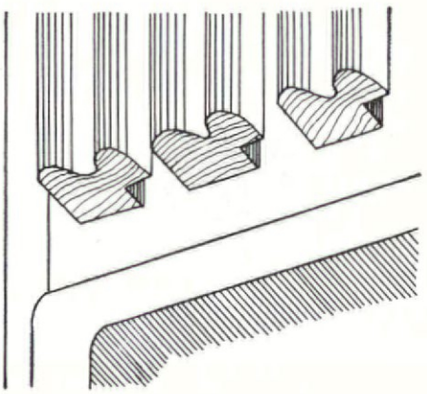
EQUIP
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RANGES

if it is found that additional absorption is needed in the low frequency range. A large measure of adjustability was also designed into the plywood panels and the ribbing treatment. The absorbent blankets behind these can be removed for final tuning of the hall.

Diffusion

The interior shaping of the hall provides a considerable degree of sound diffusion. The striking array of boxes that protrude boldly in the room are highly sound diffusing, even frequencies in the low bass register, and thi should enhance acoustic uniformity of the low tones of orchestra and organ. The ceiling co tour is more useful for general diffusion a scattering than for specific directing of ra This apparently was a deliberate part of t design to obtain a full-blended tone. There however, a general ceiling contour that allo some additional directing of reflections towa the rear of the hall.





Figs. 7 & 8: (above) View of "Copenhagen ribbing that lines the auditorium walls. (Below) Detail o wooden ribs. Thick absorbent pads are behind batten

* * *

In every respect, the Royal Festival Hall is outstanding achievement in planned acousti The reverberation time is designed to an "int national average" of best present practice. T shape of the room should yield a highly unifo acoustic condition throughout the seating are The cardinal requirement for low backgrou noise has been given unusual consideration. P vision was made for modifying the reverberat time and its frequency characteristics if desi on the basis of listening tests. The subtle s jective reactions of listeners and musicians h been sampled in a broad program which continue during the early use of the hall. this direct approach, the designers have c tributed a better understanding of the attribu of distinctness, definition, and clarity on the hand, and fullness of tone and blending qua on the other. Finally, a most striking exam has been set for the collaborative working ou acoustics in a large building project.



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No other roofing material gives the architect the freedom in roof design possible with Follansbee Terne Metal. Starting with the three standard types of Terne roofs—Standing Seam, Flat Locked Seam and Ribbed or Batten Seam, you can develop individual roof styling for any type of building. And you can bring color—*any color*—into your design to harmonize with the house exterior and its surroundings.

Look to Follansbee Terne Metal—the roofing with a future—to put the crowning glory on your latest designs.



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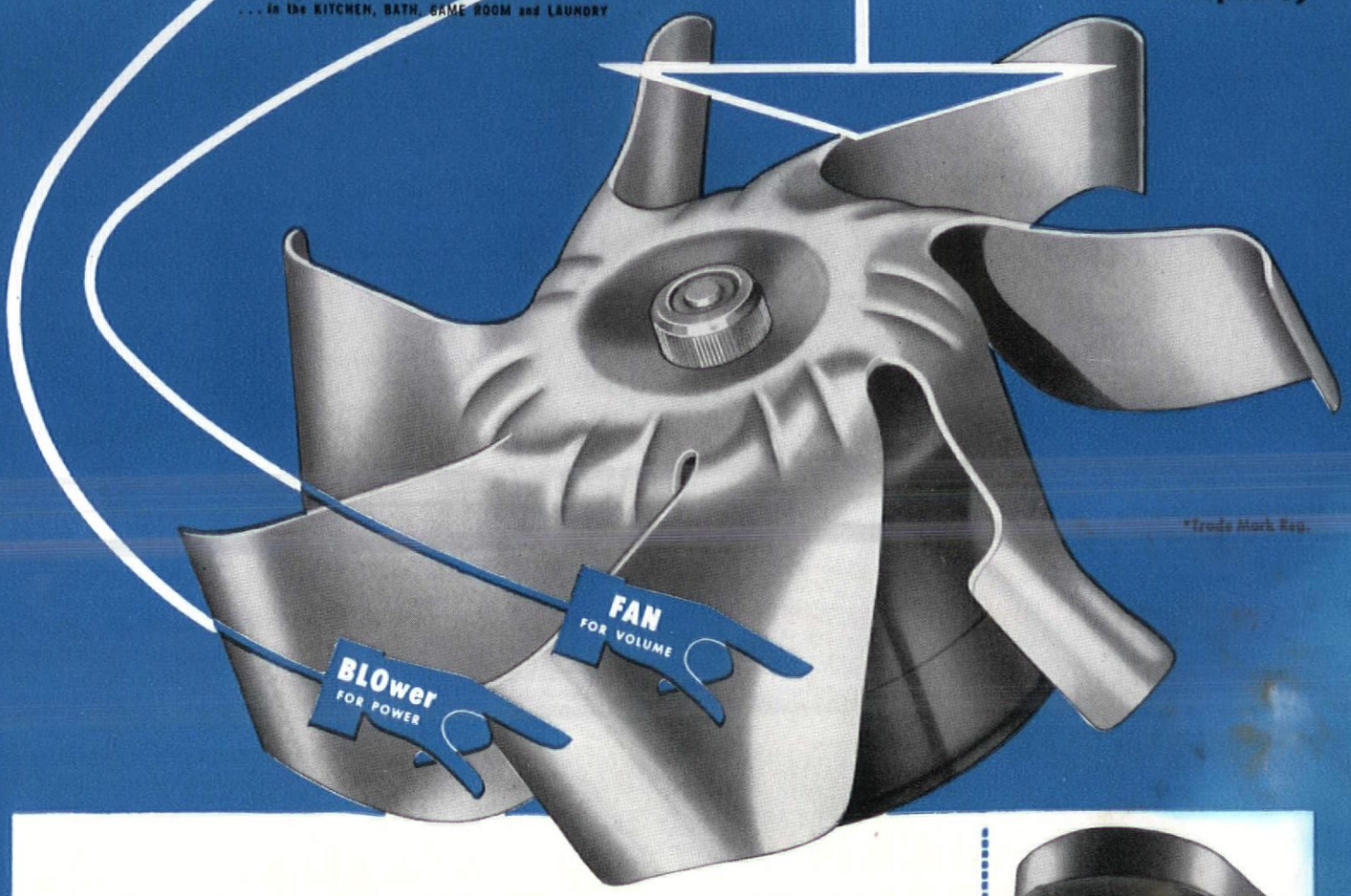
Follansbee Metal Warehouses
Pittsburgh, Pa., Rochester, N. Y., and Fairfield, Conn.

ONLY Blo-Fan* HAS THIS BLADE

The superior electric exhaust ventilator which provides spot ventilation at the point of air pollution
. . . in the KITCHEN, BATH, GAME ROOM and LAUNDRY

In ventilation- "THE BLADE'S THE THING"

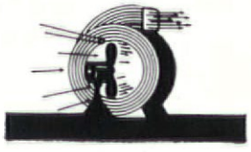
(with apologies to Will Shakespeare)



*Trade Mark Reg.

Blo-Fan REALLY MOVES AIR

The Blo-Fan blade is designed so that the fan element literally scoops up the air, keeping the blower element supercharged at all times. This patented design combines the volume of a breeze fan and the power of a blower to expel more air quickly, quietly and with greater efficiency.



Blo-Fan IS EASY TO REGULATE

This NINE-speed switch is an exclusive feature on Blo-Fan Model 210 . . . At low to medium speeds, Blo-Fan will easily handle the normal volume of steam and fumes, but in emergencies (like burning the toast) a higher speed will clear the room immediately.



Blo-Fan IS EASY TO CLEAN

NO TOOLS ARE EVER REQUIRED. Both grille and motor assembly are removed easily in less than a minute for cleaning and washing. Just unscrew the center cap.

Blo-Fan PAYS FOR ITSELF

Savings on soap, detergents and cleaning compounds will pay for Blo-Fan in a short time—not to mention the savings on redecorating costs, elimination of back-breaking work, housemaid's knee and calloused hands!



The entire unit fits flush with the finished ceiling or wall.



The motor is rubber mounted to insure quiet operation.



Only the attractive, chrome-finished grille is visible.

PRYNE & CO., INC., BOX A-851, POMONA, CALIFORNIA

Eastern Factory: Newark, New Jersey. Warehouses: Los Angeles, San Francisco, Chicago, Atlanta

Blo-Fan* AMERICA'S MOST IMITATED HOME VENTILATOR

(Continued from page 143)

credit. This is because neither dividends on stocks nor income on tax exempt bonds is included in computing the corporation's excess profits tax; thus capital used to buy these securities cannot be included in figuring the 12% of invested capital allowed as EP credit. Buying real estate, however, costs a corporation no such cut in EP credit. On the contrary, it can help build a credit if it involves borrowings. Big mortgages and little down payments will be a great help. In fact, you get increase on your credit on the borrowed capital represented by the mortgage.

Real estate sales may boom

A property sale at a profit may greatly improve the tax positions of both seller and the buyer. The selling corporation can often recoup the capital gains tax cost of realizing the higher value. This capital gains tax (25%) may be offset by the credit against excess profits tax afforded by 12% of the higher value realized. (This credit is allowable because the higher value realized by the selling corporation is considered an addition to the equity capital invested in the firm). The buying corporation, on its part, may find its tax position improved by the higher depreciation rate which it will secure on the property.

For the selling corporation, the deal works like this: Suppose a corporation sells a property at $1,000,000. Say the property stands on the seller's books at a depreciated cost of $100,000.

Gain is	$900,000
This costs 25% in capital gains tax	225,000
This increases total capital in the corporation by	675,000
This capital increase gives a 12% allowance to cut EP taxes amounting to	81,000
This cuts the corporation's EP taxes by 30% per year or	24,300

This is how the same deal might work out to the profit of the buyer:

Suppose our hypothetical property is a hotel which had originally cost its owner $500,000. It income before $10,000 depreciation was $160,000 It carried an annual excess profits tax liabilit of $27,000 and a total tax liability of $92,00(This had left only $68,000 for profit.

Now let's assume another corporation buy this property for $1,000,000. This is wha happens:

Excess profits protection can go up fro $60,000 (12% of $500,000) to $120,000 (12 of $1,000,000).

Depreciation rate can go up from 2% $500,000 to 4% of $1,000,000. A depreciatic rate of $40,000 a year would cut taxable pro from $150,000 to $120,000 a year. This wou eliminate excess profits tax and reduce the nc mal tax to $51,150. Thus out of the same befor depreciation earnings of $160,000, the new own would have $118,350 ($50,350 more) for expa sion and for stockholders!

Perhaps the worst effect of the excess prof tax is that these advantages can only be realiz when a property changes hands. As we have see both a seller and a buyer stand to gain son thing on the tax angle. But a corporation whi has built a property up to a point where it beginning to pay off and would like to hold to it will find almost all profits taken away the 77% tax.

What the high bidders want

The high personal rates (now and expecte have also accelerated the search for tax p tected real estate investments. What does individual investor seek? Why is it that he l high—perhaps way above the fair price?

One thing today's investor is *not* seeking taxable income. Instead, he wants property wh the depreciation allowance is greater than income. He can get the same effect by buy stock of real estate companies where proper are held on the books at a high cost.

(Continued on page 234)



Humphrey **GAS UNIT HEATERS** are the oldest brand on the market, measured in years, and the *newest,* measured in improved heating performance.

Inside and out, Humphrey advanced engineering reveals itself in improved design features that contribute directly to better heating results, reduced fuel consumption, lower maintenance expense, and more lasting dependability.

It pays to recommend Humphrey Gas Unit Heaters for all types of commercial and industrial jobs. They are quickly and economically installed, since they require no boiler, no fuel storage facilities, no steam or hot water pipes.

"Write for this valuable FREE engineering bulletin!"

IMPROVED — "Free-Flow" heat exchanger, provides more efficient transfer of heat, with no tubes to clean. A Humphrey exclusive.

IMPROVED — Tilting Front, directs the heat where you want it, *without* restricting air flow. A Humphrey exclusive.

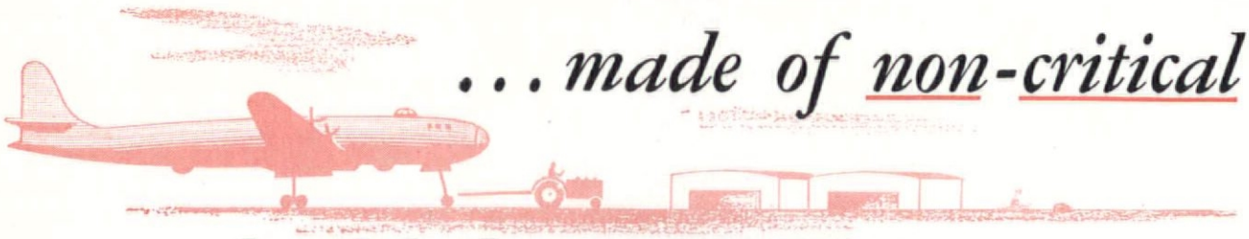
IMPROVED—Stainless steel, "Dual-Flame" burner, provides high efficiency, with life-time trouble-free service. A Humphrey exclusive.

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CONSERVE VITAL RAW MATERIALS

use BRICK and TILE!

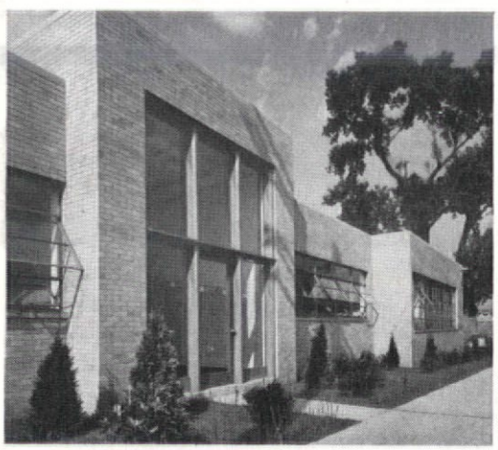
...made of non-critical clay



to build the essential structures of defense

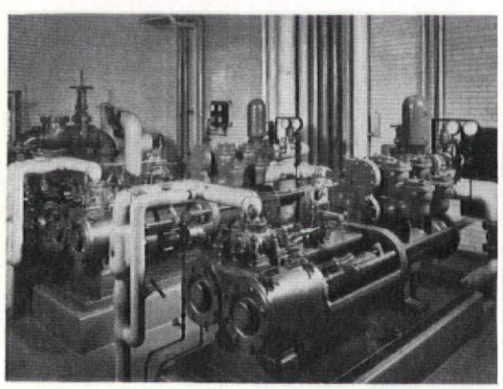


DEFENSE PLANTS



FACTORIES

photo by C. D. Hubbard



POWER PLANTS

photo by Hedrich-Blessing

To conserve vital raw materials, building today is limited by the Controlled Materials Plan.

BRICK and TILE, made of readily available, *non-critical* clay, can be your valuable ally while you operate under this plan. By using these structural clay products, you accomplish two things.

You avoid problems of shortages of materials and you comply with the CMP objective of freeing more, vital raw materials for the weapons of defense.

You build *finer* structures, too, when you build with BRICK and TILE. To schools, hospitals, power plants, research laboratories, factories or defense plants, these time-tested building products lend beauty, permanence, freedom from costly upkeep and investment protection through higher resale value.

With BRICK and TILE you construct buildings that say *quality* from completion of the job through many years to come.

"FLOW CHART" TELLS THE STORY

Our new, illustrated brochure explains how quality becomes a part of BRICK and TILE—how these products will help you build better. Just write Dept. MB-8 of the SCPI office nearest you for your free copy. We welcome your inquiry for assistance or information on Structural Clay Products.

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402 Swetland Bldg. ..... Prospect 1-5247

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Detroit, Michigan
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Webster 5-2433

Pittsburgh 22, Pa.
902 Standard Life Bldg.
Atlantic 1-6393

Chicago 1, Ill.
228 North LaSalle St. Randolph 6-0578

Ames, Iowa
120½ Welch Avenue 2442

Council Bluffs, Iowa
425 North 6th Street 38266

Minneapolis 4, Minnesota
206 Wesley Temple Bldg. Geneva 7055

Denver 4, Colo.
116 West 10th Avenue ..... Acoma 6884

Phoenix, Arizona
1538 West McDowell Road 2-0470

San Francisco 5, Calif.
55 New Montgomery St. ..... Sutter 1-7642

Seattle 4, Washington
204 Central Bldg. ..... Eliot 6227

Portland 4, Oregon
317 Builders Exchange Bldg.
Atwater 6443

Clay Products Association
of the Southwest

Austin, Texas
Littlefield Building 6-2647

Oklahoma City, Okla.
First National Building 2-5337

Or the investor may buy property in a corporate name that can be used to get high corporate loans—which can then be used as a basis for further buying. So long as he can pay these loans off in cheapening money, he can be sure he has made a good deal.

Here's a deal I recently saw that produced tax exempt income for the stockholders. The group bought stock of an apartment house. Depreciation available to them was $13,500 for the year. Here are the figures:

(1) Cash income after all expenses, including interest and amortization	$11,433
(2) Amortization of the mortgage is nondeductible and must be added back	4,800
(3) Taxable income before depreciation	$16,233
(4) Less depreciation	13,500
(5) Net taxable income	$2,733
(6) Non-taxable cash (1) minus (5)	$8,700

If all available cash less the tax cost is distributed to stockholders, it will not be taxed as dividends. Given high tax rates, this kind of deal naturally pushes prices way beyond true values.

Land prices may rise

If, as we have seen, the 77% tax rate discourages the seeking of property income in excess of depreciation, we can predict that this distortion of the normal buying point of view may be carried even farther. What could really be more suitable for tax purposes than unimproved property which, of course, will produce no income at all? If this sounds doubtful, recall that unimproved property can also be heavily mortgaged to help build up an EP credit for its owner. I think the sudden popularity of real estate purchase will extend to unimproved land, with an increase in land prices.

More lease-back deals

Sale and lease-back deals are bound to get a whale of a lot of popularity from the excess profits tax. The selling corporation can't lose. Whether the sale turns out to be a capital gain or loss, the selling corporation can benefit taxwise and still retain the use of the property.

On a gain, the corporation's profit (less the 25% tax cost) is an excess profits credit addition. On a loss, the loss is an ordinary one, deductible in full against all corporate income.

Here's about how a deal shapes up today. Say the property stands on the owner's books at a depreciated cost of $200,000. Annual depreciation is $7,500. It can be sold for $600,000 and leased back for $30,000 a year. On its $400,000 profit (selling price minus depreciated cost) the owning corporation would pay a $100,000 capital gains tax (25 per cent). But it would realize a clear $500,000 in cash *and still increase its net by $5,625 a year.* Here's how this net increase would work out for a corporation in the 77% excess profits bracket with earnings of $200,000 before taxes and property charges:

	Before deal	*After deal*
Profit	$200,000	$200,000
Property charge	7,500	30,000
Profits before taxes	192,500	170,000
Excess profits credit	50,000	86,000*
Total tax	127,725	99,500
Net after tax	64,775	70,400

So in one shot, the selling corporation has gotten $500,000 in cash and also increased its net income $5,625 a year for the duration of the excess profits tax.

When you sell the property on one of these lease-back deals, you lose, of course, the depreciation deduction. But the rent (after figuring the interest) may be larger than the depreciation you would get on the property if you did not sell. And you get the rent deduction over the life

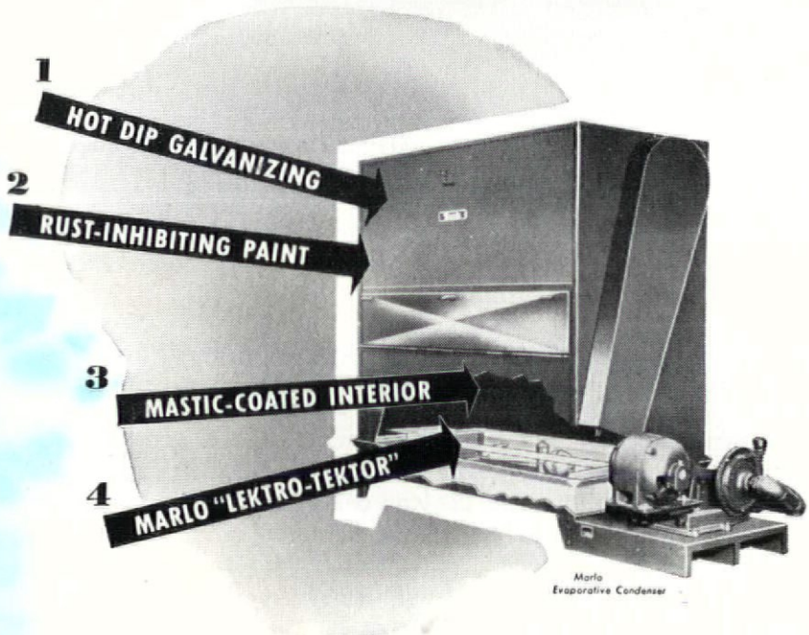
* Increased by 12% of gain on sale, less capital gains tax.

(Continued on page 236)

NOW...MORE IMPORTANT THAN EVER

...MARLO QUADRUPLE PROTECTION

against CORROSION!



With greater emphasis being placed constantly on *endurance* of equipment, Marlo Evaporative Condensers and Cooling Towers offer this exclusive four-way protection to assure more dependable and longer-lasting installations for you:

OUTSIDE — Marlo galvanized sheets and frames are sprayed with a special rust-inhibiting alkyd resin-base paint that forms an extra front line barrier against corrosive elements.

INSIDE—sheets, panels and galvanized parts are coated with a sound deadening asbestos-asphalt mastic that doubles as an efficient corrosion-retardant. Marlo's exclusive "Lectro-Tektor" affords additional internal protection by preventing electrolytic sump tank corrosion.

Write for information on the complete Marlo line.

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MANUFACTURERS OF

MARLO HEAT TRANSFER
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COOLING TOWERS • EVAPORATIVE CONDENSERS • INDUSTRIAL COOLERS
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SCHLAGE LOCKS

...used in the world's finest buildings



The Presidential Apartments

at River Park, Philadelphia

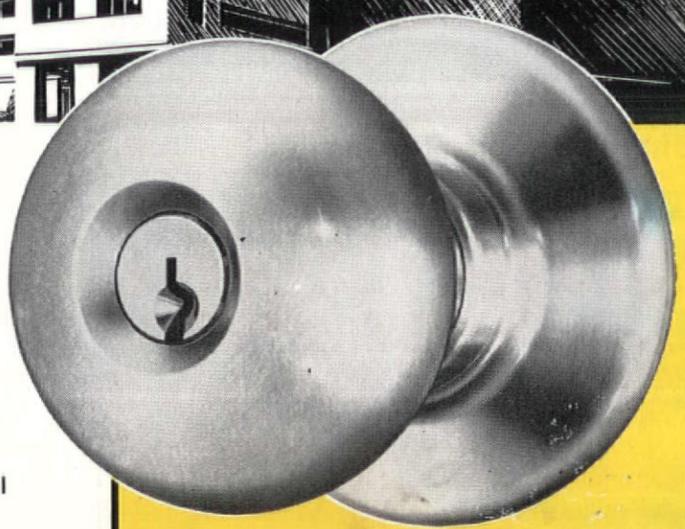
Architects: Sweet & Schwartz

General Contractors: Turner Construction Co.

Builder: Mayer I. Blum & Sons

Owner: Country Club Estates, Inc.

Designed for gracious living, the Presidential Apartments are equipped throughout with Schlage locks . . . selected for their appearance, convenience and dependable performance.



PLYMOUTH DESIGN used in these three outstanding buildings

SCHLAGE®

THE WORLD'S MOST IMITATED LOCK

SCHLAGE LOCK COMPANY

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SCHLAGE PRODUCTION and DELIVERY

The Schlage Lock Company is devoting its entire manufacturing efforts to the production of locks. Output is limited to certain designs and finishes in accordance with Government restrictions on the use of raw material. This has necessarily extended delivery dates, but Schlage quality is being maintained.

of the lease, whereas in many cases, most of the depreciation allowance has already been used up. A final advantage: you have the use of the purchase price which may yield more than the interest figured in the rent.

One of the best deals is to sell and lease-back only the land. This is why: You do not get a depreciation deduction for land if you own it. But if you sell the land and lease it back, you can take a deduction on the rent you pay for it.

Push to sell old real estate corporations

One authority (William H. Harrar) in *Taxes* says that the real estate business will be taxed more heavily than other types of industry, because real estate corporations meet none of the tests for automatic relief and usually cannot make a very good showing of capital invested as an EP credit.

As an example, he points to the more obvious incidents of office-building operation:

Nearly every large office building or hotel venture is financed by means of one or more bond issues. Bond retirements will cause a steady and continuing diminution in the borrowed capital component of the excess profits credit.

Many office buildings and hotels were acquired by their present owners, for a song, at bankruptcy or foreclosure sales. Unless substantial amounts were invested in capital improvements or unless allowances are made for whatever good will a bankrupt real estate concern may be deemed to have had, the invested capital credit will not be impressive. So these owners, too, will have every incentive to sell and little or none to hold on to their properties.

Real estate collapsibles are still with us

Although it tried hard to, the 1950 tax law does not necessarily kill the collapsible corporation idea. We still have this highly inflationary device—set up to secure a 25% tax rate for the real estate developer.

One new easy way out is to use a collapsible partnership; the law does not affect this at all. And since we can sell the partnership interest for a capital gain, we can usually come out more than even.

Here are some other operating mechanics being used today:

Have the corporation sell part of the property at a gain. Then liquidate the entire corporation. If at least 30% of the gain on liquidation comes from the gain made on the sale of the property, you get capital gain tax treatment on the entire liquidation. Of course, you do not get the full advantage of the collapsible corporation as before the new law. The corporation has to pay a tax on the gain. But you do get a considerable amount of income out as capital gain. This is especially valuable where the corporation owns apartment houses or similar property. Then it can sell enough houses to realize the necessary 30% gain and distribute the other buildings among the original stockholders.

Do not have your liquidation until the corporation has realized a substantial part of the expected income from the property produced. What is a substantial part? Nobody knows yet. But it probably is considerably less than half—say about 30%. Again, you do not get the full advantage of a collapsible corporation, but there is still considerable gain to be obtained at capital gains rates.

Use a setup of a parent corporation owning a subsidiary which in turn owns a subsidiary. The subsidiary is the corporation which owns the property. Sale of the stock of the parent does not seem to come within the collapsible corporation proscription in the new law.

The high taxes which have spawned all these real estate deals and double-deals can scarcely be called a burden; they might even be called a subsidy to many. They are not saving us from inflation, but they are causing many changes in managerial and investor thinking. The result is inevitably diversion to one of the fields we have discussed. I think that can only produce higher prices for real estate.

NERVASTRAL SEAL-PRUF

the ideal waterproof sheeting for "1001" industrial applications

The following authorized distributors of NERVASTRAL SEAL-PRUF stand ready to fill your orders promptly

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Nervastral Seal-Pruf Sheeting is . . .

Especially adapted for use on spandrel beam waterproofing—no mastic required except for spotting. Eliminates additional plies of other types of waterproof products, when employed for membrane waterproofing;

unsurpassed in its resistance to water, water-vapor, acids, alkalies and weather conditions;

completely unaffected by portland cement or concrete—retaining its initial excellent waterproofing qualities when in contact with these materials;

extremely versatile—since, in addition to waterproofing, it reduces vibration, increases resistance to corrosion, and affords good protection for outdoor insulated ducts, pipe lines and industrial equipment;

easy to handle—because it remains flexible and pliable winter and summer;

economical—because it reduces labor costs appreciably.

Here is a "one-package" waterproofing medium.

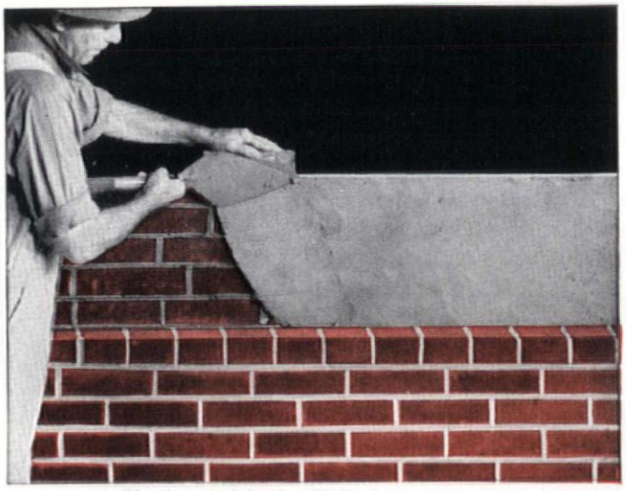
AVAILABILITY: Rolls 72-ft. long—in widths 8"—12"—15"—18"—20"—24"—30"—36". Other special widths provided on request.

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Gentlemen: Please send me further information about NERVASTRAL SEAL-PRUF. I am particularly interested in the following applications:
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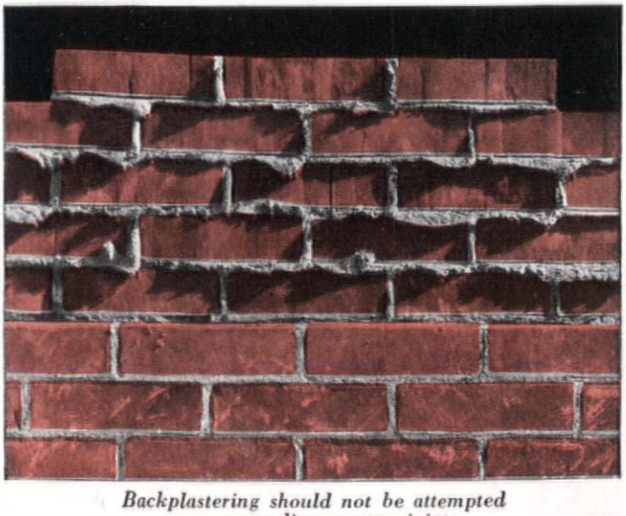
GOOD BRICKWORK = GOOD DESIGN + GOOD WORKMANSHIP + GOOD MATERIALS



The face brick should be backplastered.



If the back-up units are laid first, the front of the back-up units should be plastered.



Backplastering should not be attempted over protruding mortar joints.

PARGING

WITH

BRIXMENT

HELPS ASSURE

DRY WALLS

WE SUGGEST THAT—

The face brick should be backplastered with not less than ⅜ of an inch of mortar before the back-up units are laid.

Or, if the back-up units are laid first, the front of the back-up units should be plastered with not less than ⅜ of an inch of mortar before the face brick are laid.

Heavy rains don't make brick walls leak — they merely reveal the fact that the walls contain voids or passages through which the water may penetrate.

Dry brick walls are primarily the result of good design and good workmanship. Good materials are important, but still secondary. The more *plastic* the mortar used, the easier it is for the bricklayer to deliver good workmanship.

The photos at the left show some points of *good workmanship.*

Brixment mortar has greater plasticity, higher water-retaining capacity and better bonding quality. Because of this *combination* of advantages, architects, contractors and dealers all over America have for thirty years made Brixment the largest-selling mortar material on the market. Why not try it yourself?

LOUISVILLE CEMENT COMPANY, Incorporated, LOUISVILLE, KENTUCKY

(Continued from page 169)

Attractive colors are a sales feature

Much of the attractiveness of the houses comes from the color schemes. Instead of the usual row of white houses which Washington house buyers are accustomed to seeing, Holmes Run presents a pleasant array of soft shades of green, brown, yellow, blue or gray. These are fixed in sequence for best blending and owners cannot choose a house and then choose a color. There is no chance that three blues will be together.

For their interior colors, however, owners can have as much latitude as they wish—with several different colors for each room.

House is cheaper to build

The Lurias are finding their new house is simpler and faster to build than their old Colonial types. There are fewer pieces of material to handle. Almost one entire side wall is made up of plywood panels or windows. Posts, panels and beams are all precut. Beams with outriggers to support the roof overhang at the ends of the house are pre-assembled. As indicated earlier, there is much less grading to do than is customary. The plank and beam roof goes on easily and there is no plasterboard ceiling to add.

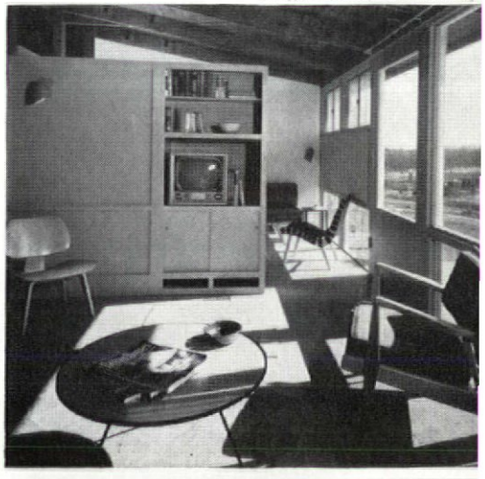
The cost of interior finishing is low because structural posts and mullions are left untrimmed. Storage closets, the large storage wall and the kitchen pass-through are prefabricated.

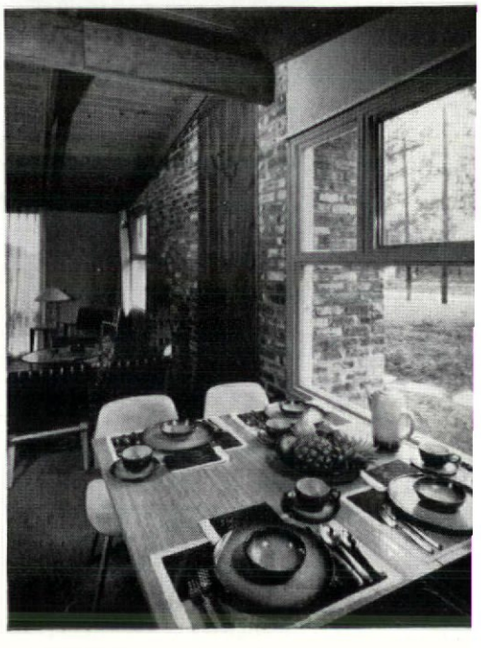
The builders have discovered that the new designs make it easier to organize their crews than on previous jobs. A trade can move in, finish its work, and move on to the next house. There is a minimum of confusion, or forcing one trade to wait for another.

The architects have been paid an initial fee of 12% of the cost of the first house plus a lump sum of $3,200 in lieu of royalties for the continued use of the plans. For architectural variations of the basic design, site planning and job supervision the architects get an hourly rate based on three times their drafting cost.

This arrangement has reduced substantially the cost of architectural services per house for the builder. For the architects it has removed the gamble and delay associated with royalties, for this sum has been guaranteed by the builders irrespective of the number of houses built.

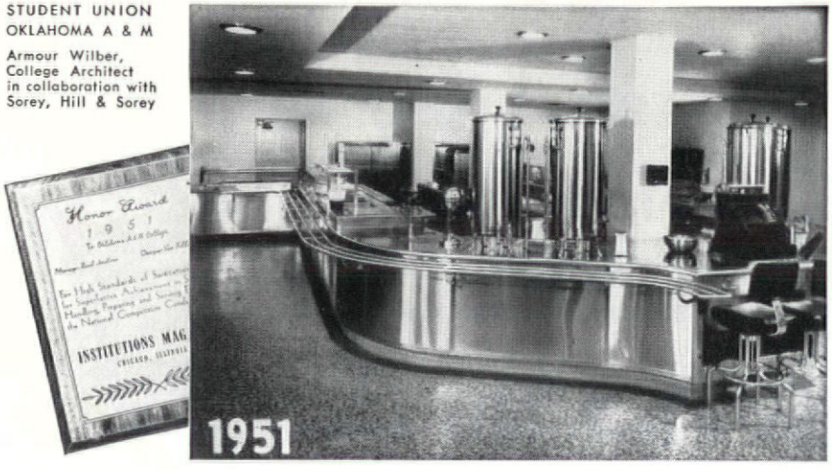
Photos: Robert C. Lautman





STUDENT UNION
OKLAHOMA A & M

Armour Wilber,
College Architect
in collaboration with
Sorey, Hill & Sorey



★

VAN customers award winners for 5 years!

★ The buyer of food service equipment and his architect should be impressed by the five-year consistent parade of awards to Van clients by the successive annual boards of experts of the magazine INSTITUTIONS.

★ Grand Awards to Mills Restaurant, Cincinnati, Hotel Roanoke, Roanoke, Virginia, Michigan State College, and awards to Hartford Hospital, McCall's Industrial Cafeteria, Oklahoma A & M and many others give fresh recognition to the quality of equipment Van makes.

★ If you require food service equipment improvements, get the benefit of *Van's century of experience.*

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...and reduce the cost of maintaining cleanliness to an all-time low.

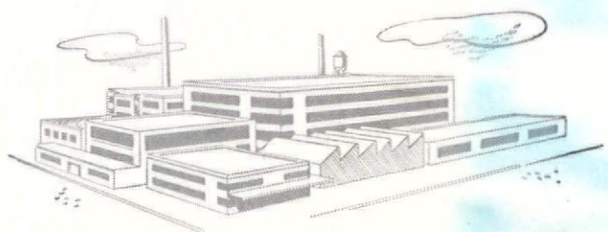
Immaculate cleanliness is no problem in rest rooms with fixture-bare floors—where plumbing fixtures are off the floor, because there is nothing to interrupt the sweep of the broom and the swish of the mop. Fixture-bare floors reduce the day-by-day dollar cost of maintenance to an all-time low while lifting sanitation to a new high. The New Way uses wall type plumbing fixtures installed the Zurn Way — the simple, fast, safe way to install wall type closets, lavatories, sinks and other fixtures. The New Way reduces the cost of building and gains more usable floor space and protects rest rooms against premature obsolescence. Insist on wall type plumbing fixtures in rest rooms of old and new factories, in schools, hospitals and every other type of building. Write for booklet entitled "You Can Build It (Cubic Foot of Building Space) For Less The New Way".



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The NEW WAY

Yes, for as much as 10% less! The New Way reduces the use of building materials, eliminates the necessity of suspended ceiling constructions to seal off drainage lines; it saves time and labor required for completing plumbing fixture installations. Insist on wall type plumbing fixtures installed with Zurn Wall Closet Fittings and Carriers.





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(Continued from page 165)

and time. His modern plans have quick acceptance."

Ted B. Brown, San Angelo builder, reports that he has not found Cole's units to be cheaper than ordinary closets but the floor area saved by the units is an asset. Greatest value of the cabinets, Brown says, is their sales attraction.

P. S. Luttrell of Houston reports that it is no special problem to build a house without the usual bearing partitions. He says the Fabricon units "represent quite an advance over the traditional job-built closets and are a sales attraction to my customers."

Thus far none of the units have been shipped farther than about 1,000 miles. If Cole should get a big job in some distant area he would probably set up an assembly plant.

For a builder interested in the prefabricated cabinets best proof that he can afford to buy them is in the houses already built—and that is where Cole's three-pronged activities come into full sway. One of the houses he built for speculation had 820 sq. ft. plus a 264 ft. carport. Its cost breakdown is typical. Total direct cost was $5,939 or about $6.60 per sq. ft. This house had about $1,400 worth of Fabricon units.

Labor costs were as follows: foundation, $323; carpentry, $641; walks & drives, $28; common, $8. Total $1,000.

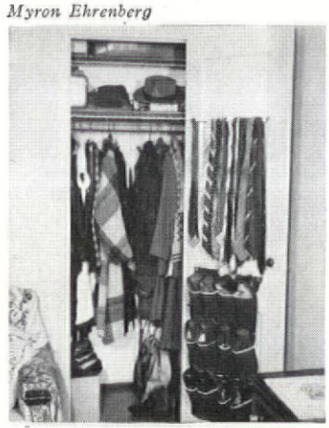
Sub-contracts ran to $1,580: rent on foundation forms, $30; waterproofing, $45; plumbing, $620; electric, $145; roofing, $149; painting, $373; ceramic tile, $75; floor covering, $113; landscaping, $29.

Foundation, (excluding labor) $518; total hardware, $82; total structural lumber, $327; sheathing, $113; building paper, $11; siding, $217; plasterboard, $71; insulation, $39; louvers, $22.

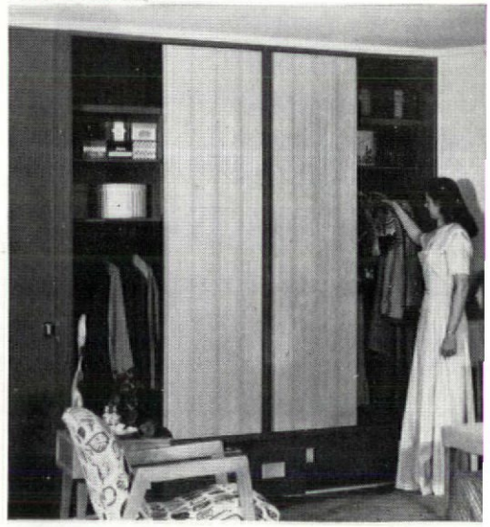
Miscellaneous millwork, $501, divided as follows: sash & glazing, $321; exterior doors, $53; trim, $127. Fabricon units and door assembly, $1,344; cabinets, $66; bath accessories, $12.

Total material cost was $3,324. The sub-total of labor, sub-contracts and materials was $5,904. Building fees and title expense were $35; plans, specifications and estimates were $145, for a total (without land) of $6,084.

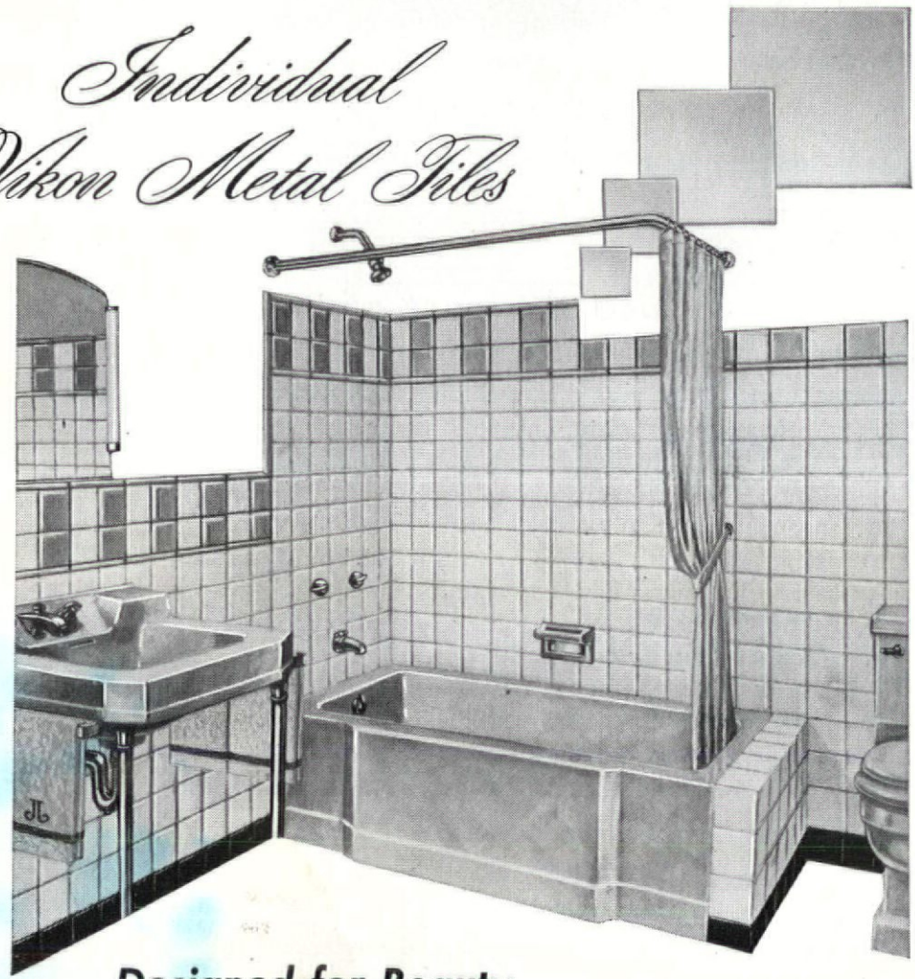
Myron Ehrenberg



Felder Photo Co.



Why Cole's prefabricated cabinets have sales appea is illustrated in these two photographs. About hal the contents in a typical small closet are tucked ou of sight at either end. With a storage wall of thre cabinets, Cole gives a master bedroom 8 linear f of well-arranged closet space, plus 4' in the thir section which faces a bedroom on the opposite sid



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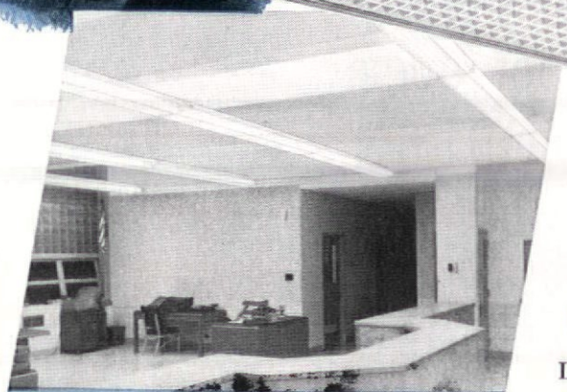
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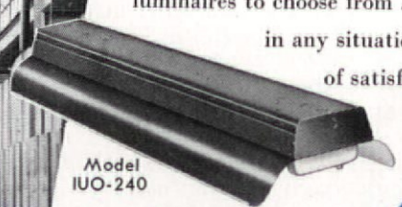


The "Stratoliner"—Highly efficient, heavy-duty, all-steel industrial fixture. Removable end caps and turret-type sockets for easy servicing. Open and closed end models for 2 or 3 40-watt lamps (IUO-240, IUO-340) or 2 100-watt lamps (IUO-2-100).

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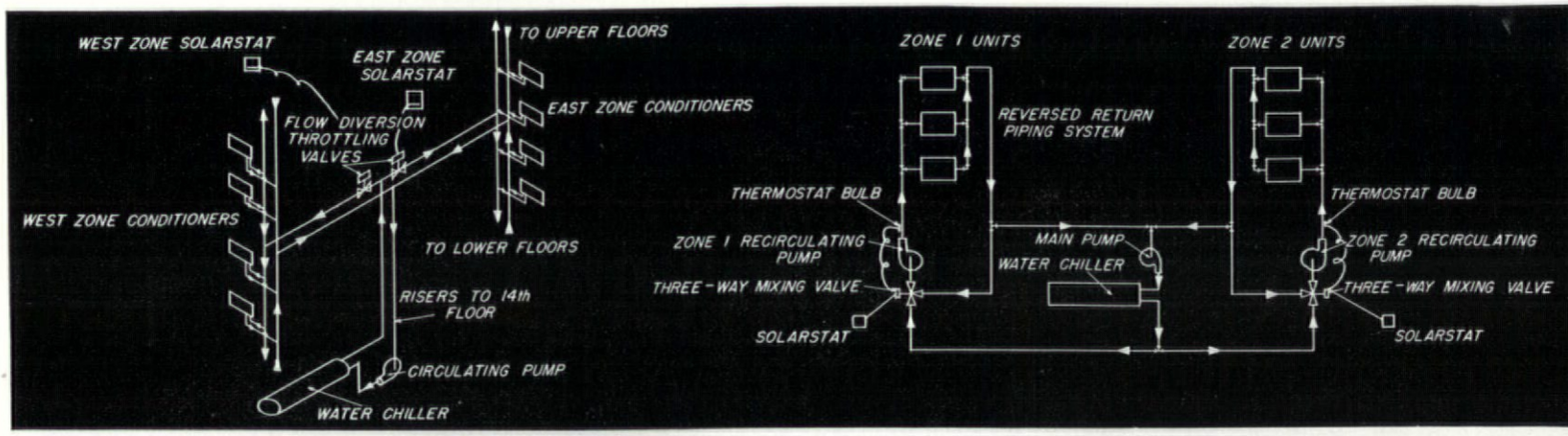
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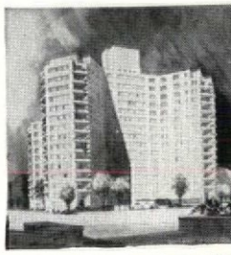
Vertical scheme of system is shown in diagram, left. Above is the sketched zone and the control system for one of the Rittenhouse apartments.

a month to cool. The smallest actual apartment (1 room plus bath and kitchenette) will rent for from $85 to $105. The largest with 3-bed rooms run from $270 to $300. In the financia middle, an apartment with one bedroom, kitchen bath, and living-dining room will cost some where between $145 and $185 per month. One thing is agreed: the new air-conditioned Ritten house apartment houses have rented easily—bu owners think that the location is even more im portant than the air-cooling.

Philadelphia was out ahead of New York in the field, but several builders in New York an nounced plans to put up air-conditioned apart ments last month (see below). In New York it will be even more expensive to be cool, al though the systems will be of similar design by other manufacturers. Builder Sol G. Atlas let i be known he was going to put up an air-condi tioned apartment house on East End Ave. in New York, which would rent for $75 per room His average apartment will be 3.9 rooms, and cost $2,000 to air condition—about $50 per room per year including depreciation (heating would add $20 per room to bring the thermal conditioning up over 10% of the building cost.) Another tall cool and expensive new apartment house was announced for completion in 1952 by the Paul Tishman Co. in the fashionable Sutton Place neighborhood in New York. It will occupy a block front on Sutton Place South, and contain 19 floors of apartments, a total of 363, from two to nine rooms each. The air conditioning system will be roughly similar to the Rittenhouse Apart ments in Philadelphia, but by a different manu facturer, and rents will start at $1,900 per year for the two room apartments.

Louis Checkman





New York luxury apartments are going up soon with air conditioning. Architect Arthur Weiser's design for Paul Tishman Inc. is shown in model form (left). Right is rendering of Architect Lathrop Douglas' apartment house for Sol Atlas.



The Geilich Tanning Co., of Taunton, Massachusetts, operating one of the most progressive plants in its industry — has, during its ten years in this city, transformed one section after another of an ancient structure into thoroughly modern and efficient working areas. Two of these sections are already daylight-illuminated by Wascolite Sky Domes, and additional installations will be made as soon as plans are completed.

Progressive architects have been prompt in recognizing the many advantages Wascolite Sky Domes have over conventional type skylights.

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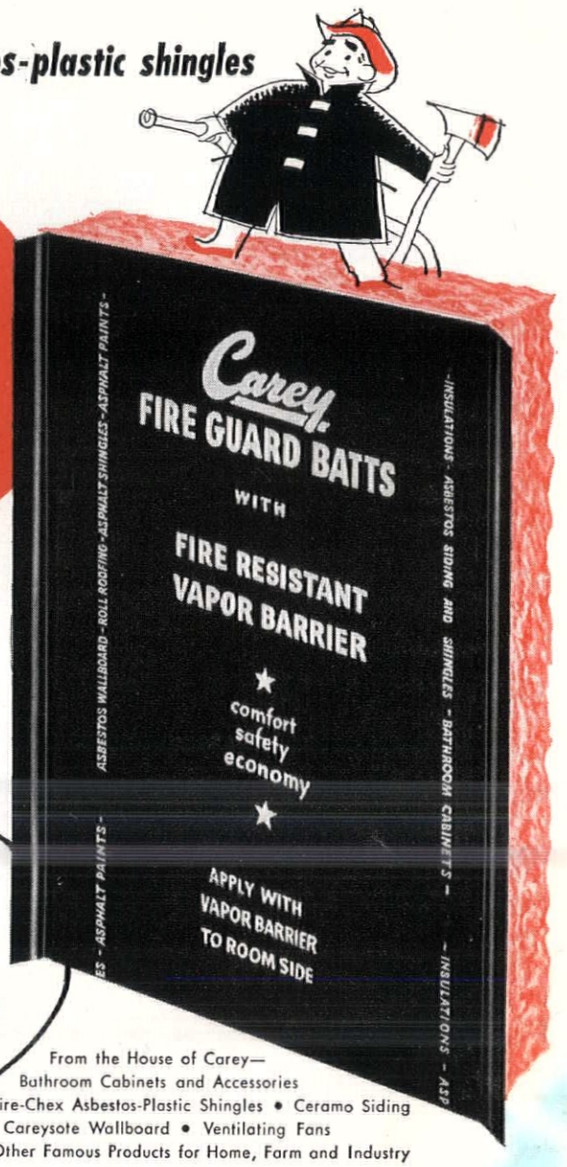
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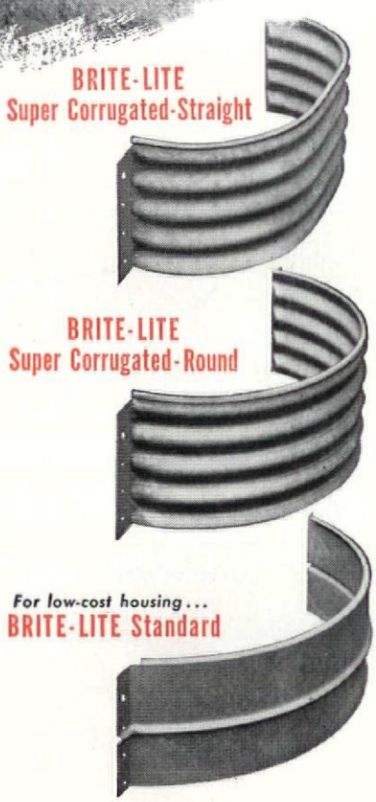


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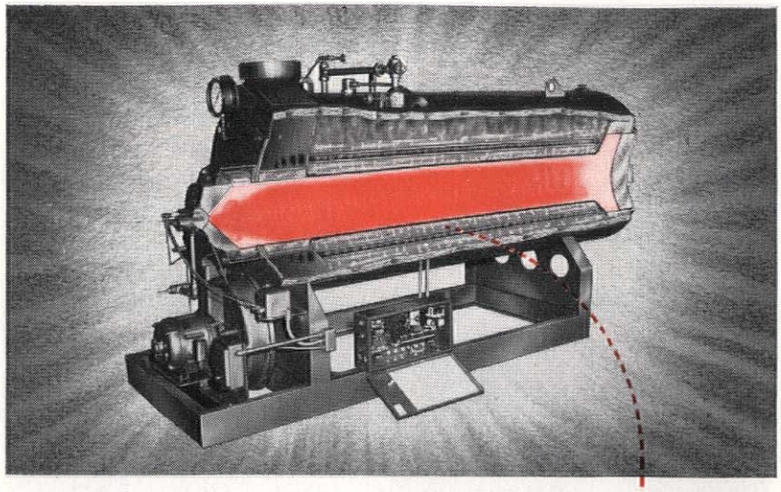
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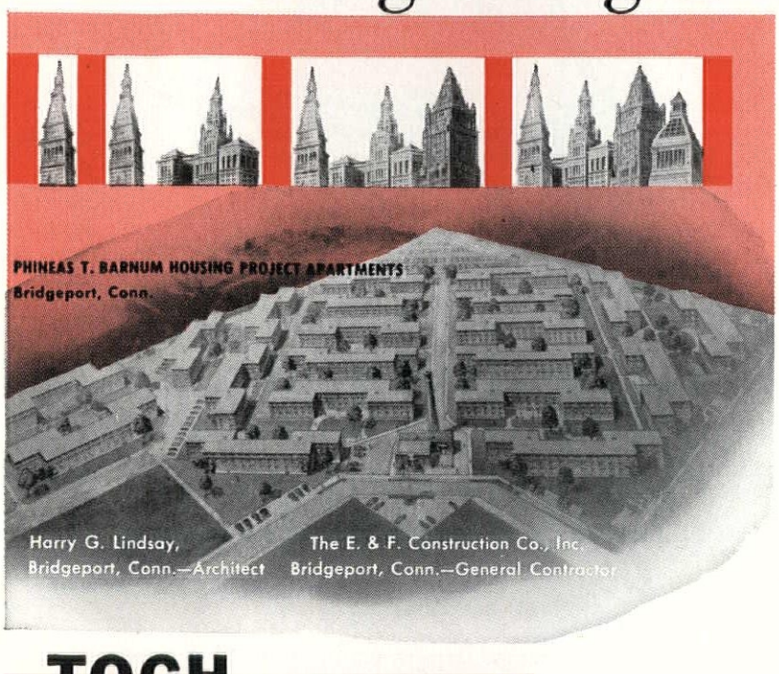
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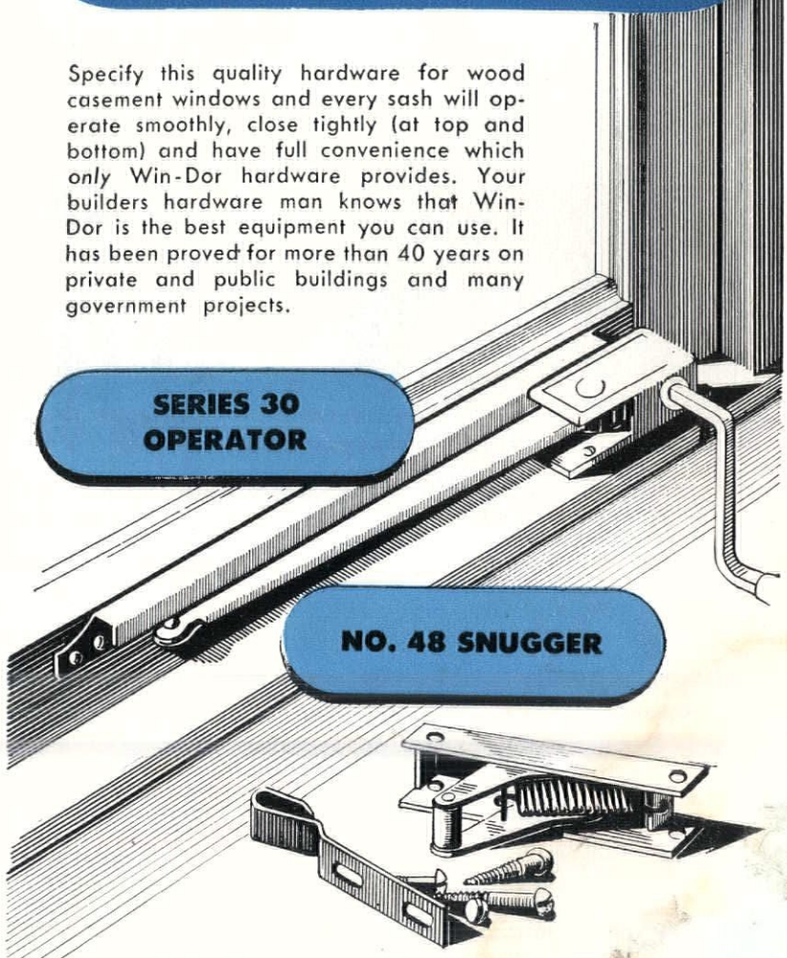
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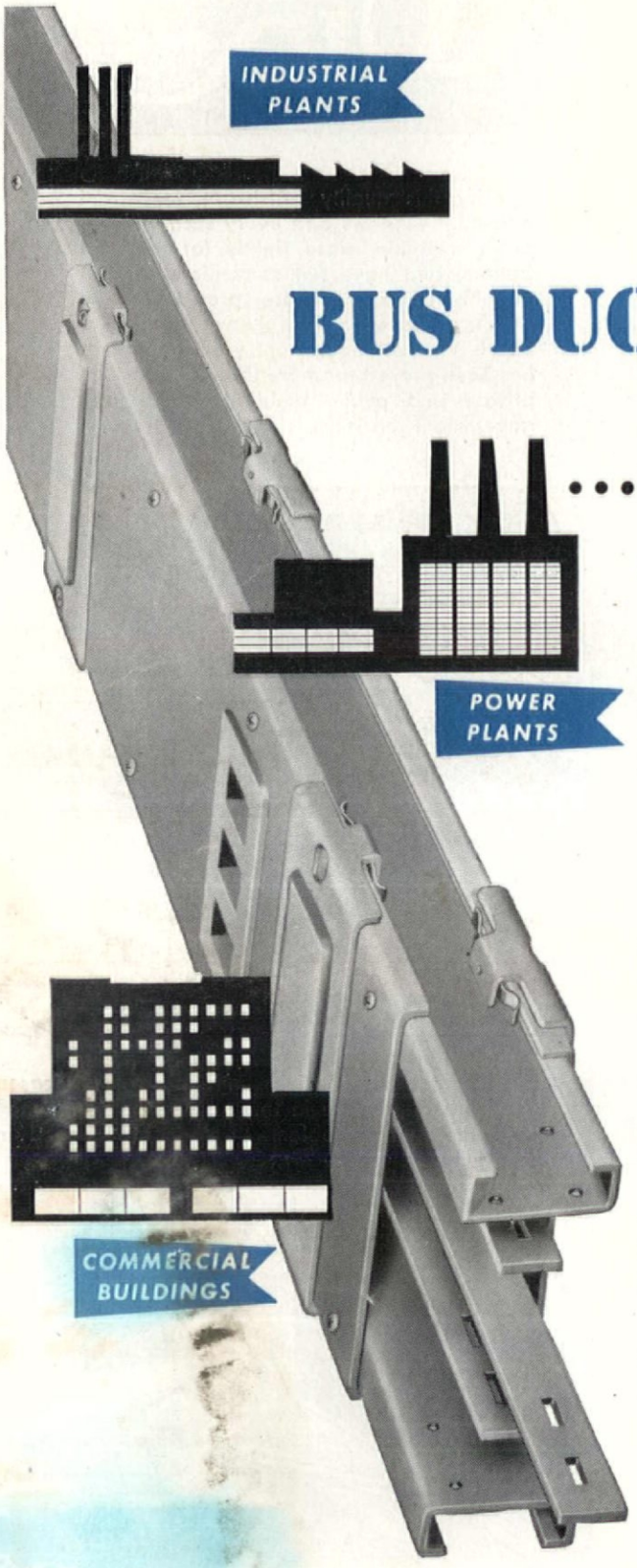


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Fourth, Westinghouse Duct is designed for virtually any type of building, and for any load requirement. For light loads, use Plug-In Duct. For high capacity use Low-Impedance Duct.

For complete information, call your Westinghouse representative or write for Manual B-4272-A, Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pa.

J-30059

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